



## School of Medicine

Office of the Registrar

April 26, 2010

Larry Shapiro, M.D.  
Dean  
Washington University  
School of Medicine

Dear Dean Shapiro,

In accordance with the School of Medicine guidelines for proposing new degree programs, I have completed the administrative review of the proposal for the program leading to the degree Master of Population Health Sciences submitted by Dr. Graham Colditz. The proposal has satisfactorily addressed all substantive administrative concerns and my understanding is that it was also approved by the Committee on Academic Affairs. Assuming the budgetary review was also completed without concern, with your approval, this proposal is ready for consideration by the Executive Faculty.

Please let me know if there is anything further I can provide for your review of this proposed degree program.

Sincerely,

Deborah A. Monolo  
Assistant Dean for Academic Affairs and Registrar

cc: Dr. Graham Colditz  
Dr. Alex Evers  
Ms. Adelaide Donnelly  
Ms. Courtney Beers

# Washington University School of Medicine

## Application for a New Degree Program Entitled “Master of Population Health Sciences” (MPHS)

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## **Washington University School of Medicine**

### **Community Health and Population Science: Building on the Plan for Excellence**

In 2009, Dean Shapiro charged the leaders of current masters programs in the medical school to review their curricular offerings and build on the goals of the Plan for Excellence, as approved by the University Trustees, to achieve efficiencies in education as the School builds its academic excellence in Community Health and Population Sciences.

One of the goals in the Medical School Plan for Excellence is to train experts and academic leaders in Community Health and Population Science and provide broad exposure to these disciplines for students, trainees, and faculty. One step in achieving this goal is defined as developing a joint MD/master's degree and a Master's Program in Population Health Sciences which will share curricula with other masters programs in the School of Medicine and provide strength in quantitative methods and clinical effectiveness as well as opportunities for specialization in genetic epidemiology, psychiatric epidemiology, clinical investigation, health-services research and knowledge translation. The program will place Washington University School of Medicine at the forefront of training physicians and other clinicians to lead clinical effectiveness and outcomes research in academic programs and in translation from research to practice settings (T2 research).

To achieve this challenge, leaders of the existing academic Master's programs and senior faculty in population sciences met several times during the first half of the year, and worked in smaller groups to achieve consensus in identifying both overlap of course offerings, areas requiring the development of new courses, and resources available in statistics on the Danforth campus that are not currently being accessed by students on the Medical campus. In all, more than 20 WUSM faculty participated in the review of course offerings and identification of additional needs for state-of-the-art training. Additional input was obtained from fellows, residents, and medical students.

#### **Institutional situation.**

With the advent of the 2-year MPH program offered at Washington University through the Brown School of Social Work, MPH students may focus their electives in their second year on genetic epidemiology or other courses offered at the Medical School. The two-year MPH aims to train non-physicians who are committed to improving the health of vulnerable communities and populations for a future in public health.

Programs for physicians and other clinical graduate audiences can now be more effectively integrated into a one-year Master's program at WUSM that specifically addresses the training needs of clinicians in clinical research methods and is appropriately paced to build on their extensive training in clinical and biologic sciences.

Bringing instruction into a course-based program addressing methods in clinical and outcomes research that is focused on a clinically trained audience can better meet the needs of students, potentially free instructors from some of the introductory courses that currently duplicate effort, and bring new faculty to focus on advanced courses. In particular, developing instruction in a modular

format that will meet the needs of residents and fellows can also increase access for these trainees as well as for medical students and help meet the growing demand among the medical student body for greater training opportunities in population health related disciplines. Numerous peer institutions offer advanced degrees for residents and fellows focusing on quantitative research methods and clinical effectiveness. Making such programs available to our clinical trainees will further increase the quality of our postgraduate training programs. These comparable programs at leading peer institutions are summarized in the appendix.

### **Clinical Epidemiology Programs offered at leading academic centers**

To place the needs and opportunities for clinical epidemiology training at Washington University School of Medicine in context we reviewed the activities of leading institutions in the US and internationally. One-year full time programs are now the norm for clinicians pursuing a career in clinical research. In general, several of the leading programs offer summer courses tailored to clinical fellows (Johns Hopkins & Harvard Schools of Public Health, U Penn School of Medicine), as an adjunct to the full year programs. In addition to a sequence of epidemiology and biostatistics, applied courses in health service research, meta-analysis and research synthesis, and the use of large databases are common. Knowledge translation and implementation research methods focused on T2 issues are newer offerings at only a few programs. A recurring theme is that such programs have restricted enrolment to physicians and others with clinical training.

Washington University School of Medicine has outstanding strength among faculty in epidemiology, knowledge translation, and implementing prevention strategies across the care continuum. Expertise in measures for health outcomes statistical genetics, and statistical methods applied to clinical trials and health service research is adequate to build additional applied courses.

The resident and fellow pool at Barnes and Washington University is outstanding, and many clinical training programs have numerous trainees (residents and fellows) keen to obtain advanced training in research methods for clinical outcomes and effectiveness research. Staying in St. Louis for this training allows for clinical commitments timed before classes begin or after the term ends – options which the same trainees have trouble implementing if they go to programs at Harvard, Hopkins or other comparable training locations. The Olin Business School (Bruce Hall, MD MBA) and Brown School offer several courses in health policy. The Brown School has strong courses in behavioral aspects of health and is developing additional courses in international health. The Medical Anthropology program in Arts and Sciences includes international health and welcomes additional medical students.

Numerous programs for physicians at comparable institutions use 4 8- or 9-week “terms” so that an adequate range of courses can be offered and the depth in research methods needed for advanced courses can be covered in the first half of the program. This allows for far more advanced training tailored to the needs of clinical trainees in the second half of the year.

Typical programs are summarized briefly in the appendix.

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

### PROPOSAL for NEW DEGREE GRANTING PROGRAMS

Proposed name of program

Population Health Sciences

| Check One | Level of Degree      | Proposed Name of Degree                     |
|-----------|----------------------|---|
|           | Bachelor             |   |
| X         | Master               | Master of Population Health Sciences (MPHS) |
|           | Master of Arts       | M.A.  |
|           | Doctor of Philosophy | Ph.D.                                       |

|                     |   |
|---------------------|---|
| Director of Program | Graham Colditz, MD, DrPH<br>Niess-Gain Professor of Surgery, Professor of Medicine<br>Associate Director Prevention and Control, Alvin J.<br>Siteman Cancer Center,<br>Deputy Director, Institute for Public Health |
| Mailing Address     | 660 South Euclid, Box 8100<br>St. Louis, MO 63110   |
| Office Location     | School of Medicine Campus<br>Kingshighway Building<br>216 South Kingshighway, Suite 2306<br>St. Louis, MO 63110   |
| Building            | Kingshighway Building   |
| Room number         | Suite 2306  |
| Telephone number    | (314) 454-7940  |
| Facsimile number    | (314) 454-7941  |
| e-mail address      | mphs@wudosis.wustl.edu  |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

### Checklist For Review of Program

- Initial Review and Approval by Program Committee
- Initial Review and Approval by Department Head or Program (i.e., OT, PT, HA) Director
- Initial Review and Approval by Dean to proceed with development of formal proposal
- Submit proposal for review by Administration of School of Medicine  
Includes review by Registrar, Budget Office and Office of Medical Education
- Administrative review forwarded to Dean of School of Medicine
- Approval by Dean to present proposal to Academic Affairs Committee
- Review and Approval by Academic Affairs Committee
- ☐ Presentation of Proposal to Executive Faculty of School of Medicine for review and approval

### For degree granting programs where recommendation for degree will be directly from the School of Medicine

- ☐ Proposal forwarded to Chancellor for review and approval
- ☐ Presentation of Proposal to Board of Trustees for review and approval

### For degrees awarded upon recommendation of other Schools including Graduate School of Arts and Sciences

**NA** Approval from School of Medicine forwarded to other relevant School

Review and Approval by School from which recommendation for degree will emanate

**NA** Proposal forwarded to Chancellor by School which will recommend establishing the new degree granting program

**NA** Review and Approval by Chancellor

**NA** Presentation of Proposal to Board of Trustees for review and approval

# DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

## Proposal for New Degree Granting Programs

### Academic

1. List all faculty of the proposed program (duplicate this page as necessary).

| Name                          | Rank                 | Primary Department           | Role in Program         |
|-------------------------------|----------------------|------------------------------|-------------------------|
| Graham Colditz, MD, DrPH      | Niess-Gain Professor | Surgery                      | Program Director        |
| Lauren Arnold, PhD, MPH       | Instructor           | Surgery                      | Coursemaster            |
| Kathleen Wolin, ScD           | Assistant Professor  | Surgery                      | Coursemaster            |
| Richard Griffey, MD, MPH      | Associate Professor  | Emergency Medicine, Medicine | Coursemaster, Preceptor |
| Mario Schootman, PhD          | Associate Professor  | Medicine                     | Coursemaster            |
| Pamela Owens, PhD             | Assistant Professor  | Medicine                     | Coursemaster, Preceptor |
| Bruce Hall, MD MBA            | Professor            | Surgery                      | Teacher, Preceptor,     |
| Jeffrey Peipert, MD, MPH, MHA | Professor            | OBGYN                        | Preceptor               |
| David Stamilio, MD, MSCE      | Associate Professor  | OBGYN                        | Preceptor               |
| George Macones, MD, MSCE      | Professor            | OBGYN                        | Preceptor               |
| Jean Wang, MD PhD             | Assistant professor  | Medicine                     | Teacher, Preceptor      |
| Jay Piccirillo, MD,           | Professor            | Otolaryngology               | Preceptor               |
| Kenneth Carson, MD            | Instructor           | Medicine                     | Preceptor, Teacher      |
| Monique Williams, MD, MSCI    | Assistant Professor  | Medicine                     | Preceptor, Teacher      |
| Ross Brownson, PhD            | Professor            | Surgery                      | Instructor              |
| Seth Strobe, MD MPH           | Assistant Professor  | Surgery                      | Teacher, Preceptor      |
| Will Ross, MD MPH             | Associate Professor  | Medicine                     | Preceptor               |
| Jefferson Gill, PhD           | Professor            | Political Science            | Teacher                 |
| Consuelo Wilkins, MD          | Associate Professor  | Medicine                     | Preceptor               |
| Jane Garbutt, Mb ChB,         | Associate Professor  | Medicine                     | Preceptor               |
| Amy Waterman, PhD             | Assistant Professor  | Medicine                     | Preceptor               |
| Vicky Fraser, MD              | Professor            | Medicine                     | Teacher, Preceptor      |
| Doug Mann, MD                 | Professor            | Medicine                     | Teacher, Preceptor      |
| William Chapman, MD           | Professor            | Surgery                      | Preceptor               |
| Gerald Andriole, MD           | Professor            | Surgery                      | Preceptor               |



## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

|                                  |                     |                    |                    |
|----------------------------------|---------------------|--------------------|--------------------|
| Julie Margenthaler, MD           | Assistant Professor | Surgery            | Preceptor          |
| Kathleen Ramon, MD MPH           | Assistant Professor | Surgery            | Preceptor          |
| DC Rao, PhD                      | Professor           | Biostatistics      | Preceptor, Teacher |
| Melvin Blanchard, MD             | Associate Professor | Medicine           | Preceptor          |
| Yan Yan, MD PhD                  | Associate Professor | Surgery            | Preceptor, Teacher |
| J. Phillip Miller, MS            | Professor           | Biostatistics      | Preceptor          |
| Clay Dunagan, MD                 | Professor           | Medicine           | Preceptor          |
| Bettina Drake, PhD, MPH          | Assistant Professor | Surgery            | Preceptor, Teacher |
| Aimee James, PhD, MPH            | Assistant Professor | Surgery            | Coursemaster       |
| Siobhan Sutcliffe, PhD, ScM, MHS | Assistant Professor | Surgery            | Preceptor          |
| Erica Waters, PhD, MPH           | Assistant Professor | Surgery            | Preceptor, Teacher |
| Mary Politi, PhD                 | Assistant Professor | Surgery            | Preceptor, Teacher |
| Kimberly Kaphingst, ScD, MA      | Assistant Professor | Surgery            | Preceptor, Teacher |
| Joaquin Barnoya, MD MPH          | Assistant Professor | Surgery            | Preceptor, Teacher |
| Adam Kibel, MD                   | Professor           | Surgery            | Preceptor          |
| Thomas Bailey, MD                | Professor           | Medicine           | Preceptor          |
| Margaret Olsen, PhD MPH          | Assistant Professor | Medicine           | Preceptor, Teacher |
| Bradley Stoner, MD PhD           | Associate Professor | Medicine           | Preceptor          |
| Gary Weil, MD                    | Professor           | Medicine           | Preceptor          |
| F. Sessions Cole, MD             | Professor           | Pediatrics         | Preceptor          |
| Michael DeBaun, MD MPH           | Professor           | Pediatrics         | Preceptor          |
| Alison Cahill, MD MSCI           | Assistant Professor | OBGYN              | Preceptor          |
| Jennifer Allsworth, PhD          | Assistant Professor | OBGYN              | Preceptor          |
| Anthony Odibo, MD MSCE           | Associate Professor | OBGYN              | Preceptor          |
| Laura Bierut, MD                 | Professor           | Psychiatry         | Preceptor          |
| Linda Cottler, PhD               | Professor           | Psychiatry         | Preceptor          |
| Pam Madden, PhD                  | Professor           | Psychiatry         | Preceptor          |
| Andrew Health, DPhil             | Professor           | Psychiatry         | Preceptor          |
| Kathleen Bucholz, PhD, MPH       | Professor           | Psychiatry         | Preceptor          |
| Joseph Deasy, PhD                | Professor           | Radiation Oncology | Preceptor          |
| Dennis Hallahan, MD              | Professor           | Radiation Oncology | Preceptor          |
| Jeff Michalski, MD               | Professor           | Radiation oncology | Preceptor          |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

|  |                     |                                     |                         |
|--|---------------------|-------------------------------------|-------------------------|
| Barry Siegel, MD                             | Professor           | Radiology                           | Preceptor               |
| Suresh Vedantham, MD                         | Professor           | Radiology                           | Preceptor               |
| Dione Farria, MD MPH                         | Assistant Professor | Radiology                           | Preceptor               |
| David Gierada, MD                            | Professor           | Radiology                           | Preceptor               |
| Steven Kymes, PhD                            | Assistant Professor | Ophthalmology and visual sciences   | Coursemaster, Preceptor |
| Katie Plax, MD                               | Assistant Professor | Pediatrics                          | Preceptor               |
| Allison King, MD, MPH                        | Assistant Professor | Occupational therapy and Pediatrics | Preceptor               |
| Carolyn Baum, PhD                            | Professor           | Occupational Therapy                | Preceptor               |
| Ramesh Raghavan, MD PhD                      | Assistant Professor | Brown School                        | Preceptor               |
| Christopher Carpenter, MD, MSc, FACEP, FAAEM | Assistant Professor | Emergency Medicine, Medicine        | Preceptor               |
| Daniel Theodoro, MD                          | Assistant Professor | Emergency Medicine, Medicine        | Preceptor               |
| John Newcomer, MD                            | Professor           | Psychiatry                          | Preceptor               |
| Kenneth Schechtman, PhD                      | Associate Professor | Biostatistics                       | Preceptor, teacher      |
| Ira Kodner, MD                               | Professor           | Surgery                             | Preceptor               |
| Michael Province, PhD                        | Professor           | Genetics                            | Preceptor               |
| Ingrid Borecki, PhD                          | Associate Professor | Genetics                            | Preceptor               |
| Susan MacKinnon, MD                          | Professor           | Surgery                             | Preceptor               |
| E. Turner Overton, MD, MPH                   | Assistant Professor | Medicine, Infectious Disease        | Preceptor               |
| Mario Castro, MD                             | Professor           | Medicine, Pulmonary                 | Preceptor               |
| Mark Manary, MD                              | Professor           | Pediatric Emergency Medicine        | Preceptor               |
| Robert Naismith, MD, MPH                     | Assistant Professor | Neurology                           | Preceptor               |
| Bradley Schlaggar, MD                        | Professor           | Neurology                           | Preceptor               |
| Andrew Kates, MD                             | Associate Professor | Medicine, Cardiovascular            | Preceptor               |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

2. *List members of the Program Committee. (This committee is charged with responsibility for overall oversight of the program including review of policies and procedures, curriculum, etc. At least half of the members must be full-time faculty members.)*

Graham Colditz, MD, DrPH

Lauren Arnold, PhD, MPH

Melvin Blanchard, MD

Brad Evanoff, MD, MPH

Jeff Gill, PhD

Richard Griffey, MD, MPH

Bruce Hall, MD, PhD, MBA

Aimee James, PhD, MPH

Andrew Kates, MD

Allison King, MD, MPH

Tim McBride, PhD

J. Phillip Miller, MS

Pam Owens, PhD

Jeff Peipert, MD, MPH, MHA

Jay Piccirillo, MD, FACS

Will Ross, MD, MPH

Monique Williams, MD

Kathleen Wolin, ScD

Charles Zorumski, MD

Student representative: Arun Ganti (1<sup>st</sup> year medical student)

Resident representatives: Michael Yeung & Pei-Hsiu Huang (Cardiology)

NOTE: Unless otherwise indicated, all Program Committee members are full-time faculty members.

3. *Append a copy of the operating principles of the Program Committee (include description of meeting frequency, quorum status, voting rules).*

The MPHS Program Committee is charged with overall oversight of the program including review and approval of policies and procedures, curriculum, and requirements and competencies at the program and course levels.

The Program Committee will meet quarterly and conduct official business only when a majority of the Program Committee membership is present. The role of Chair will rotate biannually and he/she has the ability to make and assume motions. All full members may participate in debate and vote. Meeting minutes will be generated with final approval subject to confirmation by the Program Committee that the minutes accurately reflect discussion/decisions.

Program Committee members will be invited and retained on a 5-year renewable term limit basis provided they have relevant training and expertise in Population Health. The Committee will strive for gender, racial, and ethnic diversity in its composition and at least 50% of its members will be full-time faculty.

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

A subset of Program Committee members will be invited by the Program Director to represent the MPHS program on a joint MSCI/MPHS Curriculum Steering Committee (members to be named). With equal representation from both programs, the MSCI/MPHS Curriculum Steering Committee will effectively serve in an oversight capacity with specific focus on these objectives:

- Confirm that courses offered through MSCI & MPHS are not duplicative
- Identify gaps and develop competencies for new courses designed to meet common needs of MSCI and MPHS students
- Assess curriculum and related administrative processes to enhance existing collaboration between programs

4. a) *Describe selection criteria. (Notation of prior academic qualifications, review of degrees/transcripts, etc. should be included. Other items might include scores achieved on preparatory examinations as well as recommendations from suitably qualified individuals.)*

**Prerequisites:** Consistent with the academic/professional requirements of the MSCI program, all MPHS applicants must have a doctoral degree (e.g., MD, DO, DPT, PhD, PharmD). The MPHS program will accept applicants from students concurrently enrolled in a doctoral degree program, non-US residents, and students not currently funded through a K or T award.

Selection criteria are based on the Admission Committee's non-biased review of academic and professional accomplishments. Both the MSCI and MPHS program directors are committed to simplifying the application processes and requirements for potential students; to that end we will continue to meet with administrative staff to arrive at a common application and comparable supporting document requirements. Currently, the following materials are required for MPHS applicants:

### WU Residents, Fellows, Physicians, & Faculty:

- MPHS application (attached)
- Personal statement describing area of interest in clinical outcomes research and population health
- Letter from departmental leadership or fellowship training director documenting support for the applicant and allocation of dedicated time to attend classes, meet course requirements. For residents and fellows this is 80% protected time over a full academic year.
- For international applicants, TOEFL results (within two years) and GRE or MCAT results (within five and ten years respectively)

### WU Medical and Allied Health Students (eligible after Year 1):

- MPHS application (attached)
- Personal statement describing area of interest in clinical outcomes research and population health
- Essay describing how the MPHS will complement the student's medical training and how the applicant envisions putting this specialized training to use in his/her career in medicine
- One letter of recommendation from WUSTL faculty member
- For international applicants, TOEFL test results (within two years) and GRE or MCAT results (within five and ten years respectively)

### All other applicants:

- MPHS application (attached)

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

- Personal statement describing area of interest in clinical outcomes research and population health
- Essay describing how the MPHS will complement the applicant's training and how the applicant envisions putting this specialized training to use in his/her career
- Three letters of academic and professional recommendation (a minimum of one letter must reflect academic performance/potential)
- MCAT or GRE test results within five years and ten years of application date, respectively
- For international applicants, TOEFL test results (within two years)

*b) If School of Medicine is to offer degree, include description of admissions committee membership.*

The MPHS Admissions Committee will be comprised of the following full time faculty members:

Lauren Arnold, PhD, MPH  
Melvin Blanchard, MD  
Graham Colditz, MD, DrPH  
Allison King, MD, MPH  
Kathleen Wolin, ScD  
Will Ross, MD, MPH  
Consuelo Wilkins, MD

*c) Describe specifically how transfer of credits from other programs and institutions will be evaluated and handled.*

Transfer credits from other academic institutions will not be accepted. However, required courses may be waived with the approval of the Program Director and the course instructor up to a maximum of three courses. Transfer credits from other WU graduate programs are accepted with the exception of medical school coursework and with approval of the MPHS Curriculum Subcommittee. MSCI course credits will be transferable.

In instances when non-matriculated students transition to degree-seeking, credit will be transferable only for MPHS courses taken in the preceding three years.

5. Provide a list of courses for the Program (duplicate as required).

See table (below) and attached syllabi for core course competencies (Appendix B). Note: Courses offered through the MSCI and GEMS programs are highlighted below.



## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

| Course Name<br>& Number<br><br>Annotate as follows:<br>R = required course<br>E=elective course                               | Prereq<br>(Yes/No)<br>(If yes,<br>list) | Brief Description<br><br>(including goals & content as well as method of evaluation, semester to be<br>offered, day & time<br>proposed if available)  | Course<br>Director | Partici-<br>pating<br>Faculty | Grade<br>or<br>Pass/<br>Fail | Max &<br>Min<br>Enroll-<br>ment |
|---|---|---|--------------------|-------------------------------|------------------------------|---------------------------------|
| <b>The following table reflects only courses for Year 1. Additional course offerings are planned as enrollment increases.</b> |   |   |                    |                               |                              |                                 |
| Introduction to SAS (R)<br>M21 503  | No                                      | Offered: Summer Session through the GEIMS program   |                    |                               | G                            | Min 5<br>Max 50                 |
| Ethical and Regulatory<br>Issues in Clinical<br>Research (R)<br>M17 510   | No                                      | Offered: Spring through the MSCl program  |                    |                               | G                            | Min 5<br>Max 50                 |
| Current topics in public<br>health (R for medical<br>students)<br>PS 001  | No                                      | Review current events and topics related to public health in a seminar<br>setting. Goal is to discuss application of materials learned in methods<br>courses to public health problems. Evaluation: attendance and class<br>participation<br><br>Offered: Fall 1 & 2, Friday 9-12 pm  | K. Wolin           |                               | P/F                          | Min 5<br>Max 50                 |
| Introduction to<br>Epidemiology (R)<br>PS 002   | Yes<br>Introduction to SAS<br>(M21 503) | This course introduces the basic principles and methods of<br>epidemiology, with an emphasis on critical thinking, analytic skills, and<br>application to clinical practice. Topics include outcome measures,<br>methods of adjustment, surveillance, quantitative study designs, and<br>sources of data. Designed for those with a clinical background, the<br>course will provide tools for critically evaluating the literature and skills<br>to practice evidence-based medicine.<br><br>Evaluation: Midterm and final exams, class participation, problem sets,<br>and papers.<br><br>Offered: Fall 1, Tuesday & Thursday 9-12pm | L. Arnold          |                               | G                            | Min 5<br>Max 50                 |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

| Course Name<br>& Number<br><br>Annotate as follows:<br>R = required course<br>E=elective course | Prereq<br>(Yes/No)<br>(If yes,<br>list)          | Brief Description<br><br>(including goals & content as well as method of evaluation, semester to be<br>offered, day & time<br>proposed if available)  | Course<br>Director | Partici-<br>pating<br>Faculty | Grade<br>or<br>Pass/<br>Fail | Max &<br>Min<br>Enroll-<br>ment |
|---|--|---|--------------------|-------------------------------|------------------------------|---------------------------------|
| <b>Intermediate<br/>Epidemiology (R)</b><br>PS 003  | Yes,<br>Introduction to<br>Epidemiology (PS 002) | Course focuses on advanced principles of epidemiology as they apply to clinical research. The course provides tools used in clinical epidemiology, which are crucial for making informed decisions in the care of patients. Critical thinking and scientific/analytic competencies are emphasized throughout the course.<br><br>Evaluation: A quiz, homework assignments, and final exam.<br><br>Offered: Fall 2, Tuesday & Thursday 9-12pm | M. Schootman       |                               | G                            | Min 5<br>Max 50                 |
| <b>Applied Epidemiology (R)</b><br>PS 004   | Yes<br>Intermediate<br>Epidemiology (PS 003)     | This course prepares students to apply epidemiologic research methods to a research question of interest. Students participate in the evaluation of their peers.<br><br>Evaluation: Preparation of a grant application, presentation of proposal, evaluation of peers, class attendance and participation.<br><br>Offered: Spring 1&2, Friday 9-12pm  | K. Wolin           | P. Owens                      | G                            | Min 5<br>Max 15                 |
| <b>Biostatistics I (R)</b><br>(GEMS course # - to be assigned)                                  | Yes<br>Introduction to SAS<br>(M21 503)          | Offered: Fall 1, Monday & Wednesday 9-12 pm through the GEMS program  |                    |                               | G                            | Min 5<br>Max 50                 |
| <b>Biostatistics II (R)</b><br>(GEMS course # - to be assigned)                                 | Yes<br>Biostatistics II (# TBD)                  | Offered: Fall 2, Monday & Wednesday 9-12 pm through the GEMS program  |                    |                               | G                            | Min 5<br>Max 50                 |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

| Course Name<br>& Number<br><br>Annotate as follows:<br>R = required course<br>E=elective course | Prereq<br>(Yes/No)<br>(If yes,<br>list)   | Brief Description<br><br>(including goals & content as well as method of evaluation, semester to be<br>offered, day & time<br>proposed if available)   | Course<br>Director                   | Partici-<br>pating<br>Faculty | Grade<br>or<br>Pass/<br>Fail | Max &<br>Min<br>Enroll-<br>ment |
|---|---|--|--------------------------------------|-------------------------------|------------------------------|---------------------------------|
| Decision analysis for<br>clinical investigation and<br>economic analysis (E)<br>PS 005          | Yes<br>Introduction to<br>Epidemiology (PS 002)<br>Biostatistics I (#TBD)                   | Introduce the student to the methods and growing range of applications<br>of decision analysis and cost-effectiveness analysis in health care<br>technology assessment, medical decision making, and health resource<br>allocation.<br><br>The objectives of the course are:<br>(1) to provide a technical understanding of the methods used,<br>(2) to give the student an appreciation of the practical problems in<br>applying these methods to the evaluation of clinical interventions and<br>public health policies, and<br>(3) to give the student an appreciation of the uses and limitations of<br>these methods in decision making at the individual, organizational, and<br>policy level both in developed and developing countries.<br>Course Note: Introductory course in probability and statistics required;<br>but may be taken concurrently; introductory economics is<br>recommended but not required.<br><br>Offered: Fall 2, Friday 1-4 pm | S. Kymes                             |                               | G                            | Min 5<br>Max 35                 |
| Introduction to<br>Dissemination and<br>Implementation research<br>methods (E)<br>PS 006        | No  | Offered: Winter session  | E. Proctor<br>(not<br>confirmed<br>) |                               | P/F                          | Min 5<br>Max 35                 |
| Advanced Implementation<br>and evaluation research<br>methods (E)<br>PS 007                     | Yes<br>Introduction to<br>Dissemination &<br>Implementation<br>Research Methods<br>(PS 006) | Offered: Spring 2  |                                      |                               | G                            | Min 5<br>Max 35                 |



## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

| Course Name<br>& Number<br><br>Annotate as follows:<br>R = required course<br>E=elective course | Prereq<br>(Yes/No)<br>(If yes,<br>list)                                  | Brief Description<br><br>(including goals & content as well as method of evaluation, semester to be<br>offered, day & time<br>proposed if available)   | Course<br>Director | Participating<br>Faculty | Grade<br>or<br>Pass/<br>Fail | Max &<br>Min<br>Enroll-<br>ment |
|---|--|--|--------------------|--------------------------|------------------------------|---------------------------------|
| <b>Randomized Controlled<br/>Trials (E)</b><br>PS 008   | Yes<br>Biostatistics II (# TBD)  | Topics include types of clinical trials research (efficacy and effectiveness trials), study design, treatment allocation, randomization and stratification, quality control, analysis, sample size requirements, patient consent, data safety and monitoring plans, reporting standards, and interpretation of results.<br><br>Students design a clinical investigation in their own field of interest, write a complete protocol for it, and critique recently published medical literature.<br><br>Evaluation: students complete a protocol for an RCT<br><br><i>Offered: Spring 1, Tuesday &amp; Thursday 9-12 pm</i> | G. Colditz         | P. Miller,<br>E. Liu     | G                            | Min 5<br>Max 35                 |
| <b>Meta-analysis (E)</b><br>PS 009  | Yes<br>Intermediate<br>Epidemiology (PS 003)<br>Biostatistics II (# TBD) | Review the principles and methods for combining RCT and observational studies. Introduce statistical methods to combine results and evaluation publication bias and assess heterogeneity. This course will emphasize the use of critical reviews and meta-analysis to explore data and identify sources of variation among studies.<br><br>Evaluation: Students complete protocol for meta-analysis of their choosing.<br><br><i>Offered: Spring 2, Tuesday &amp; Friday 1-4pm</i>   | G. Colditz         | K. Carson                | G                            | Min 5<br>Max 35                 |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

| Course Name<br>& Number<br><br>Annotate as follows:<br>R = required course<br>E=elective course | Prereq<br>(Yes/No)<br>(If yes,<br>list)   | Brief Description<br><br>(including goals & content as well as method of evaluation, semester to be<br>offered, day & time<br>proposed if available)   | Course<br>Director | Partici-<br>pating<br>Faculty | Grade<br>or<br>Pass/<br>Fail | Max &<br>Min<br>Enroll-<br>ment |
|---|---|--|--------------------|-------------------------------|------------------------------|---------------------------------|
| Using administrative data<br>for comparative<br>effectiveness research (E)<br>PS 010            | Yes<br>Introduction to<br>Epidemiology (PS 002)<br>Biostatistics I (# TBD)  | Introduces students to the use of administrative data. Preparation of data sets, downloading, cleaning, and planning analysis.<br>Taught by an epidemiologist schooled in CER with guest lectures from faculty in the Institute of Public Health, this course will enable students to understand the structure and content of administrative data, the sources from which the data are derived, the advantages and disadvantages of different databases, and uses of administrative data for CER. The course will also provide a solid foundation in data management, including the manipulation of large complex datasets, formation of clinically meaningful variables, creation of linkages across datasets, and a basic understanding of analytic approaches for use with administrative data for CER. Students will be instructed on administrative data housed within the ICTS Center for Administrative Data Research (CADR), beginning with discharge data followed by claims data from employers and insurers such as CMS.<br><b>Evaluation:</b> Students will be expected to use their newly acquired knowledge to complete a small-scale pilot CER project using one of the limited datasets or public-use files (e.g., HCUP, MEPS) available through CADR. Students will be required to attend lectures by the national speakers discussing administrative data and complex patient CER brought in for CRTC and Institute of Public Health seminars.<br><i>Offered:</i> Fall 2, Tuesday & Thursday 1-4 pm<br><i>Offered:</i> Spring 1 & 2, Wednesday 9-12 pm | P. Owens           |                               | G                            | Min 5<br>Max 35                 |
| Quality improvement (E)<br>PS 011   | Yes<br>Using administrative<br>data for comparative<br>research (PS 010)<br>Intermediate<br>Epidemiology (PS 004)<br>Biostatistics II (# TBD) |  | R. Griffey         | B. Hall                       | G                            | Min 5<br>Max 35                 |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

| Course Name<br>& Number<br><br>Annotate as follows:<br>R = required course<br>E=elective course | Prereq<br>(Yes/No)<br>(If yes,<br>list)  | Brief Description<br><br>(including goals & content as well as method of evaluation, semester to be<br>offered, day & time<br>proposed if available) | Course<br>Director | Partici-<br>pating<br>Faculty | Grade<br>or<br>Pass/<br>Fail | Max &<br>Min<br>Enroll-<br>ment |
|---|--|--|--------------------|-------------------------------|------------------------------|---------------------------------|
| <b>The following table reflects only courses proposed for subsequent years.</b>                 |  |  |                    |                               |                              |                                 |
| Measurement in health<br>and outcomes research<br>(E)<br>PS 012                                 | Yes<br><br>Introduction to<br>Epidemiology (PS 002)<br>Biostatistics I (# TBD) | Offered: Fall 2, Monday & Wednesday 1-4pm  |                    |                               | G                            | Min 5<br>Max 35                 |
| Community based<br>participatory research (R<br>medical student)<br>PS 013                      | No   | Introduce concepts of community based participatory research<br>Offered: Winter session  | S. Gehlert         |                               | P/F                          | Min 5<br>Max 35                 |
| Health Literacy (E)<br>PS 014   | No   | Introduce concepts of health literacy, assessment and implications for<br>communication and clinical outcomes<br>Offered: TBD                        | K.<br>Kaphingst    |                               | G                            | Min 5<br>Max 35                 |
| Biostatistics III (E)<br>(GEMS course # - to be<br>assigned)                                    | Yes<br>Biostatistics III (# TBD)   | Offered: Spring 1 through the GEMS program   |                    |                               | G                            | Min 5<br>Max 35                 |
| Biostatistics IV (E)<br>(GEMS course # - to be<br>assigned)                                     | Yes<br>Biostatistics IV (# TBD)  | Offered: Spring 2 through the GEMS program   |                    |                               | G                            | Min 5<br>Max 35                 |
| Multilevel methods in<br>health services research<br>(E)<br>PS 015                              | Yes<br>Using administrative<br>data for comparative<br>research (PS 010)       | Offered: Spring 1  |                    |                               | G                            | Min 5<br>Max 35                 |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

| Course Name<br>& Number<br><br>Annotate as follows:<br>R = required course<br>E=elective course | Prereq<br>(Yes/No)<br>(If yes,<br>list)                                  | Brief Description<br><br>(including goals & content as well as method of evaluation, semester to be<br>offered, day & time<br>proposed if available)  | Course<br>Director | Partici-<br>pating<br>Faculty | Grade<br>or<br>Pass/<br>Fail | Max &<br>Min<br>Enroll-<br>ment |
|---|--|---|--------------------|-------------------------------|------------------------------|---------------------------------|
| Screening (E)<br>PS 016   | Yes<br>Introduction to<br>Epidemiology (PS 002)                          | <i>Introduce concepts and quantitative methods for the design and<br/>evaluation of screening programs</i><br><i>Evaluation: students prepare a screening brief</i><br><i>Offered: Fall 1, Monday &amp; Wednesday 1-4pm</i> | J. Wang            | G.<br>Colditz                 | G                            | Min 5<br>Max 35                 |
| Development and<br>validation of prediction<br>rules (E)<br>PS 017                              | Yes<br>Intermediate<br>Epidemiology (PS 004)<br>Biostatistics II (# TBD) | <i>Offered: Spring 1&amp;2, Thursday 1-4 pm</i>   | G.<br>Colditz      | Gage,<br>Evanoff,<br>Yan      | G                            | Min 5<br>Max 35                 |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

### 6. Thesis Requirement

A thesis is required for completion of this degree:

☐ Yes (if yes, describe the requirement below)

☒ No

The MPHS program mandates applied quantitative coursework in lieu of a thesis. The proposed one-year, no-thesis model is consistent with competing programs at Harvard, Johns Hopkins University, and University of California – Berkeley.

If thesis is required, describe programmatic areas of study, method of evaluation, and requirements for written thesis and oral defense. Procedures for selection of thesis advisor and review committee structure and rules should be included.

Not applicable.

### 7. Calendar of the Program

*a) Provide proposed dates for matriculation, start and end of classes, semester/trimester/quarter dates, and examination periods.*

The program is designed for full-time study over the course of one academic year. Students will be encouraged to follow the recommended sequence of full-time coursework in order to complete the program in 11 months.

Classes would begin over the summer with an intensive session aimed at providing fundamentals required for introductory and advanced courses.

The start date for fall semester Session I would coincide with the University schedule. Session I (8 weeks in duration) would be immediately followed by Session II (also 8 weeks) to allow for consistency between program and University semester end dates.

Winter session is optional. It is a 2 week period in January between Fall II and Spring I with limited offering of intense courses.

Spring semester Sessions I and II would follow a similar eight-week format/succession with Session I start dates and Session II end dates corresponding with the University calendar.

The eight-week structure (with 4 sessions over the year) of the MPHS program is critical given the duration of the program and the required succession of fundamental courses in Epidemiology and Biostatistics. Whenever possible, course schedules will be coordinated with other graduate programs such as the MSCI and GEMS to facilitate cross-listing of courses and to accommodate students interested in courses offered by a peer graduate program.

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

*b) Describe how a typical student would progress through the program; i.e., courses taken in which semester, etc.*

Table 1 (below) reflects schedule and sequence for core/required courses. Table 2 reflects electives to be offered through the MPHS program. See Appendix for examples of typical student course calendars.

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

Table 1: Required MPHS Courses

| Content Area                        | Summer<br>Intensive<br>Duration: 2 weeks | Fall 1<br>Duration: 8 weeks                       | Fall 2<br>Duration: 8 weeks                       | Wintersession<br>Duration: 2 weeks | Spring 1<br>Duration: 8 weeks                                   | *Spring 2<br>Duration: 8 weeks |
|-------------------------------------|--|---|---|------------------------------------|---|--------------------------------|
| <b>Epidemiology methods</b>         |  | Introduction to Epidemiology (3)<br><b>Arnold</b> | Intermediate Epidemiology (3)<br><b>Schootman</b> |                                    | Applied Epidemiology (2)<br><b>Wolin, Owens, clinician TBN</b>  |                                |
| <b>Biostatistics</b>                | Introduction to SAS (2) via GEMS         | Biostatistics I (3) via GEMS                      | Biostatistics II (3) via GEMS                     |                                    |   |                                |
| <b>Applied Quantitative Methods</b> |  | Current Topics In Public Health (1) <b>Wolin</b>  |   |                                    | Ethical and Regulatory Issues in Clinical Research (2) via MSCI |                                |

Table 2: Electives to be offered through the MPHS program

| Content Area  | Summer<br>Intensive<br>Duration: 2 weeks | Fall 1<br>Duration: 8 weeks  | Fall 2<br>Duration: 8 weeks  | Wintersession<br>Duration: 2 weeks  | Spring 1<br>Duration: 8 weeks  | *Spring 2<br>Duration: 8 weeks   |
|---|--|------------------------------|--|---|--|--|
| <b>Applied Quantitative Methods</b>                   |  | Screening (3)<br><b>Wang</b> | Decision Analysis for Clinical Investigation & Economic Evaluation (3) <b>Kymes</b>  | Introduction to Dissemination & Implementation Research Methods (1)<br><b>Protcor</b> | Randomized Controlled Trials (3)<br><b>Colditz &amp; guest lecturers</b><br>Development & Validation of Prediction Rules (3)<br><b>Colditz, Gage, Yan, Evanoff</b> | Meta-analysis (3)<br><b>Colditz and Carson</b><br>Advanced Implementation and Evaluation Research Methods<br><b>Colditz, Brownson, Proctor</b> |
| <b>Clinical Outcomes &amp; Effectiveness Research</b> |  |                              |  |   | Quality improvement (3)<br><b>Griffey</b>  |  |
|   |  |                              | Using Administrative Data for Comparative Effectiveness Research (3)<br><b>Owens</b> |   | Cost-Effectiveness (3)   |  |



## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

### 8. *Distribution Requirements and Course Prerequisites*

- a) *What are the prerequisites for entry into this degree? (Include any prerequisites which have not been included in course-specific prerequisites noted on the earlier table.)*

Program eligibility criteria eliminate the need for pre-requisites. However, students without a clinical background may find the material or pace challenging as the program caters to clinical investigators.

- b) *Describe the distribution requirements for this degree. (Include any specific details about requirements within and between sections of the program.)*

**Required** credits will be distributed as follows\*:

|   |                        |
|---|------------------------|
| Ethical & regulatory issues in clinical research (MSCI)       | 2 credit hours         |
| Introduction to SAS (GEMS)                                    | 2 credit hours         |
| Epidemiology Methods<br>(Introduction, Intermediate, Applied) | 8 credit hours         |
| Biostatistics (GEMS)<br>(Biostatistics I, Biostatistics II)   | 6 credit hours         |
| Electives   | 15 credit hours        |
| <b>TOTAL</b>  | <b>33 credit hours</b> |

\* Joint MD/MPHS have an additional one-credit course requirement. Current topics in public health, offered in the fall for a total of 34 credit hours to graduate.

**Electives** 15 credits to be distributed among the eligible courses listed below. While there are no distribution requirements for electives at this point, as enrollment increases the MPHS intends to offer concentrations (e.g., International Health, COER) that will impose specific elective requirements.

#### **New Electives – Available in Year 1 (prerequisites indicated in Section 5)**

Decision Analysis for Clinical Investigation & Economic Evaluation  
 Meta-analysis  
 Introduction to Dissemination & Implementation Research Methods  
 Cost-Effectiveness  
 Using Administrative Data for Comparative Effectiveness Research  
 Quality Improvement  
 Randomized Controlled Trials



## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

### New Electives – Available in Year 2 or later (prerequisites indicated in Section 5)

Screening  
Health Literacy  
Chronic Disease Epidemiology  
Infectious Disease Epidemiology  
Reproductive Epidemiology  
Pharmaco-epidemiology  
Measurement in Health and Outcomes Research  
Applying Quantitative Methods to Understanding Health  
Advanced Implementation and Evaluation Research Methods  
Community-based participatory research methods  
Biostatistics III (GEMS)  
Biostatistics IV(GEMS)  
Multilevel Methods in Health Services Research  
Transdisciplinary Approaches to Disease Prevention  
Development and validation of prediction rules

### Eligible WUSM & WUSTL courses:

#### *Global/International Health – Arts & Sciences/Medical Anthropology*

International Public Health (L-48 3874)  
Transnational Reproductive Health Issues (L-48 4022)  
The AIDS Epidemic (L-48 4134)  
Medicine and Anthropology (L-48 4881, every two years)  
Health, Healing, and Ethics (L48 4834)  
Tobacco: History, Anthropology, and Politics of a Global Epidemic (L48-4135)  
Neighborhoods, Schools, and Social Inequality (L98 4289)  
Race, Ethnicity, and Culture (L98 452)  
Geographic Information Systems (GIS), Landscape, and Spatial Analysis in Archaeology (L98 4803)  
Culture and Health (L48 333)  
Researching Fertility, Mortality, and Migration (L48 4253)  
Advanced GIS Modeling and Landscape Analysis (L48 4803)  
Medicine and Anthropology (L48 4881)  
Anthropology and Public Health (L48 4882)  
The Political Economy of Health (L48 4883)  
The Anthropology of Maternal Death (L58 4254)  
Poverty in America (L18 4251)

#### *Statistical Methods – Arts & Sciences/Mathematics*

Experimental Design (L24 MATH420, every two years)  
Sampling Techniques (L24 MATH438)  
Survival Analysis (L24 MATH434, every two years)  
Bayesian Statistics (L24 MATH459, every two years)

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

- Multilevel Models in Quantitative Research (L55 ASTAT430)
- Health Policy – Brown School*
- Health Care: Policy and Services (S-40 5742)
- Health Policy – Olin School of Business*
- Health Economics and Policy (B-53 MGT321)
- Healthcare Management (B-53 MGT322)
- Psychiatric Epidemiology – School of Medicine*
- Instruments of Psychiatric Diagnosis and Assessment (M-08 Psychiatry 502)
- Landmarks in Psychiatric Epidemiology (M-08 Psychiatry 507B)
- Psychiatric Disorders of the Nervous System (M08 676)
- Genetic Epidemiology – School of Medicine*
- Fundamentals of Genetic Epidemiology (M-21 515)
- Human Linkage and Association Analysis (M 21 5483)
- Mentored Research (M21-600)
- Social and Behavioral – Brown School*
- International Health Policy (S40-6100)
- Social and Economic Development Policy (S40-5861)
- Health Care: Policy and Services (S40-5742)
- Health Promotion in Minority and Native Populations (S20-6022)
- Poverty and Inequality in America (S20-5013)
- Organizational Behavior and Theory (S20-5017)
- Health Promotion and Behavior: Theories, Problems, and Issues (S20-3022)
- Social, Economic, and Political Environment (S15-5012)

Other courses may be considered for electives if approved by the Curriculum Subcommittee (Drs. Colditz, Arnold, Wolin, Ross and Griffey) based on course requirements and competencies.

- c) *Specify the requirements for graduation. (Include information such as number of credit hours, certain grade point average, submitted thesis, defended thesis, etc.)*

Students are required to complete 33 credit-hours\* with a cumulative grade point average of 3.0/4.0 or higher. At least 24 credit hours – including all required courses - must be taken for a grade (versus pass/fail).

\* Joint MD/MPHS have an additional one-credit course requirement. Current topics in public health, offered in the fall for a total of 34 credit hours to graduate.

9. *Describe how proposals to change the curriculum or course distribution will be evaluated and acted upon.*

Modifications to curriculum and course distribution will be based on aggregated class evaluations and post-graduation feedback and will be reviewed/approved by the Program Committee and the joint MSCI/MPHS Curriculum Steering Committee. Committee meeting frequency, functions, and authority are described in Item #3 of the Academic Proposal.

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

In addition, students will complete the Clinical Research Appraisal Inventory to assess knowledge and confidence. This method of program/student evaluation is consistent with those employed by key partner programs such as the CRTC K12/MSCI program and will allow for comparison and comprehensive reporting regarding effectiveness of the program/specific courses in meeting specified competencies. MPHS evaluation objectives will be accomplished using software available through the MSCI program.

10. *Append a copy of the procedure which will be used to evaluate student performance. This document **must** contain the text as it will be distributed to participating students. Specific information about each course's grading (Pass/Fail, A/B/C, etc.) should be provided as well as the method of examination. Details of any requirement to maintain a certain grade point average for continuation in the program should be included.*

All students must maintain a minimum of a "B" in all required courses, a minimum grade of "C" or "Pass" in all other courses, and an overall grade point average of 3.0 on a 4.0 scale. Twenty-four or more of the 33 credit hours must be taken for a grade versus pass/fail; all required courses must be taken for a grade. All grades are based on satisfactory completion of the course materials and a final examination, term paper, or project.

If a student receives a letter grade below "B" or "Fail" in any required courses or below a "C" or "Fail" in elective courses, he/she will be required to repeat the course with the minimum passing grade in order to receive credit. Failure to achieve the minimum required grade in a course for the second time will result in termination from the program. "Incomplete" grades are not acceptable for graduation and students are urged to complete their assignments in a timely manner.

Students may appeal grades by filing a Grade Appeal Form (available through the Office of the Registrar) within 30 days of completing the course. Grade Appeal Forms will be reviewed by the Program Committee and will take into consideration both the student and professor perspectives.

If a student has failed to make satisfactory academic progress (minimum of "B" in required courses, minimum of "C" in electives, "Pass" in pass/fail courses), the Program Director will notify the student and his/her advisor. Failure of the student to correct the causative deficiency within the subsequent session after such notification will lead to review by the Program Committee. The review will consist of assessment of the student's academic progress to-date (including grades from all graduate level coursework) as well as the student's perspective as presented in written form or, at the request of the Program Committee, in person.

Program Committee decisions will be communicated to the student in writing. Potential actions include (1) development of a remediation plan that specifies requirements, timelines,

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

and measurements of improvement (this could include warning, probation, penalty, suspension) or (2) recommendation that the student be dismissed from the program. Recommendations for dismissal will be forwarded to the Dean of the Medical School after 14 days post-notification.

Appeals of recommendation for dismissal should be submitted in writing to the Program Director within 14 days of receipt of notice of dismissal. The Program Director will notify the Program Committee and forward the appeal to the Dean of the Medical School. The Dean of the Medical School will convene an unbiased adhoc committee comprised of equally distributed and representative clinical and pre-clinical faculty members. The adhoc committee will review the appeal to confirm that the MPHS Program Committee followed due process in its assessment, review, and conclusion. Upon request and with the advance approval of the adhoc committee, the student may appear before the committee and may request that he/she be accompanied by a WUSM faculty member, staff member, or fellow student. Final determinations will be communicated to the student in writing within 14 days of the meeting.

*If the program requires a thesis, provide information about any qualifying examinations as well as the method of review of the thesis.*

Not applicable as thesis is not required.

*A detailed description of how academic encumbrances will be handled should be provided.*

Review and resolution of academic encumbrances will be handled consistent with the deliberation process for unsatisfactory academic performance (described in Item #10).

### *11. Describe how the program will evaluate whether the objectives are being achieved.*

Individual courses and instructors will be evaluated by students at session end to ensure that objectives were outlined and met.

Evaluation of programmatic objectives will be achieved through recontact of graduating students at 12, 36 and 60 months post-graduation to solicit feedback related to relevance of MPHS coursework and applicability in current position and/or future career plans. Program success will be assessed by assigning weights and ranks to qualitative data provided in the interviews. The Program Committee will review outcomes and propose changes (when necessary). The MPHS will adopt the same evaluation system/software as the MSC1 program.

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### *12. Describe academic resources.*

#### *a) Library*

The Bernard Becker Medical School Library is the primary library resource for the MPHS program. However, students have access to all University libraries with a valid Washington University ID.

#### *b) Computing facilities*

The Bernard Becker Medical School Library has computer facilities available to students as does the Olin Residence Hall and the Student Support Office (latter two options available to medical students only). Wi-fi is available to students in WU libraries, common spaces, within some departments, and in the residential buildings (applicable to medical students only).

All students will be assigned an email address and will have access to the Internet have access to all University libraries with a valid Washington University ID.

#### *c) Academic support from faculty*

All students accepted to the MPHS program will be assigned an advisor who will be responsible for guiding the student in terms of meeting program requirements and aligning coursework and projects with his/her research interest. Advisor selection will be driven by the student's area of interest as expressed in the one-page description accompanying the program application.

Faculty willing to act as preceptors are listed in Item #1 of the Academic Proposal.

## **Administration**

### *1. Describe the matriculation procedures. (Append a copy of the offer letter and acceptance form.)*

Matriculation is initiated when a candidate expresses interest in the program. Awareness of the MPHS program will be accomplished through distribution of informational materials in paper form, electronically, and through the WUSM website. The MPHS will be marketed as distinct from other WUSM graduate programs (eg MSCI, GEMS) in its didactic approach, quantitative focus, and condensed schedule.

Inquiries will be handled initially by the Program Administrator to confirm eligibility, provide additional information, and answer general questions regarding the program. Questions that are more intensive will be handled by the Program Director and/or coursemasters.

Potential candidates will submit a formal application (components described below) for review by the Admissions Committee. The Admissions Committee reserves the right to



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request an in-person interview and/or request additional information after reviewing the application (when necessary). Admissions decisions are approved by the Admissions Committee which includes the Program Director.

The Program Administrator will notify applicants, in writing, within one week (7 days) of the Admissions Committee deliberations. The applicant is expected to respond, in writing, within one week (7 days) using the attached acceptance letter as a template. Students are officially enrolled in the program once the Program Administrator has received written documentation of acceptance and a non-refundable \$500.00 deposit that will be applied towards tuition in the Fall I session.

Students will work with the Program Administrator to register for courses, obtain an email address, and any other logistics associated with matriculation. Program administration will occur in conjunction and consistent with administration of the MSC1 program. The MPHS administrator will be physically located in the CRTC office to facilitate collaboration, even distribution of shared administrative functions for the MSC1 and MPHS programs, and to create an efficient system from the user/student perspective.

Relevant attachments:      Application form (Appendix C)  
    Notification and acceptance letters (Appendix C)

### 2. Anticipated Enrollment

a) Projected date of first matriculating students  
     August 2, 2010

b) Expected enrollment

|                       | Total | Graduate Student:<br>MD/MPHS (OT, etc) | MD:<br>Resident/Fellow/other |
|-----------------------|-------|--|------------------------------|
| 1 <sup>st</sup> year* | 7     |  | 7                            |
| 2 <sup>nd</sup> year  | 22    |  | 17                           |
| 3 <sup>rd</sup> year  | 35    | 5-per year.                            | 30                           |
| 4 <sup>th</sup> year  | 44    |  | 35                           |
| 5 <sup>th</sup> year  | 50    |  | 35                           |

\*The inaugural class will be small to allow for program development and improvement in Year 1. Student diversity will be limited in Year 1 due to timing; the initial class will be comprised primarily of students internal to WUSM/BJC.

3. Describe the application procedures for students interested in the Program, including a detailed list of all the documents which will be required for each applicant as part of the application package (e.g., copies of degrees, transcripts, letters of recommendation, application forms, etc.). Also include copies of any materials, brochures, etc. which will be used for recruitment.

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Program description, eligibility requirements, and application materials will be available on a public WU website. The MSCI and MPHS program application processes and requirements will be identical and will be published on a shared website. Because components of the application will differ dependent on student, specific requirements are outlined in Section 1. Question 4(a) of this proposal.

### 4. *Finances*

- a) *Provide the name, address, and telephone number of the contact individual in the Program Director's office.*

Until a Program Administrator is hired, contacts for the MPHS program are:

|                     |                 |
|---------------------|-----------------|
| Courtney Beers, MPH | Carol Leighton  |
| Campus Box 8100     | Campus Box 8100 |
| (314) 454-7998      | (314) 454 -7940 |

Program administration will be coordinated with assistance and training from the MSCI program administrator who has agreed to share forms, procedures, best practices, and system efficiencies for program management.

- b) *Provide a detailed budget proposal for operating the program. The budget section should also provide information about the arrangements which have been made concerning allocation of overhead costs and tuition allocation between participating schools.*

See Appendix D for itemized budget.

- c) *In the event that a student withdraws from the program, indicate how reimbursement of tuition will be handled.*

Tuition reimbursement is dependent upon the point at which the student withdraws. In all cases, notice of withdrawal must be submitted in writing. Similarly, fees are charged when students fail to meet registration and payment deadlines. Specific fees and reimbursements are as follows if students:

| <u><i>Timepoint</i></u>                               | <u><i>Fee/Refund</i></u> |
|---|--------------------------|
| Have not registered by the deadline . . .             | \$50.00 late fee         |
| Withdraw prior to the first class . . .               | Tuition refunded in full |
| Withdraw within the first week of the semester . . .  | 80% refund               |
| Withdraw within the first 2 weeks of the semester ... | 60% refund               |
| Withdraw within the first 4 weeks of the semester ... | 50% refund               |
| Withdraw after 4 weeks (50% of semester) . . .        | None                     |

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

Withdraw after start of intensive short courses . . . None

d) *Indicate how tuition will be collected. Which office will collect tuition?*

Tuition will be charged and collected through the Registrar's Office. Resolution of unpaid tuition will be handled by the MPHS Program Administrator.

e) *What are the proposed consequences for a student of failure to submit tuition in a timely manner?*

Tuition not paid by the due date set by the Registrar accrues interest at the rate of one percent per month for each month in which that payment is due. Any amounts not paid when due plus accrued interest thereon must be paid in full within three months of the original due date.

The School of Medicine will not release the student's academic record or progress reports pending settlement of any unpaid account. A student who has not satisfied all past due financial obligations to the University one month before the end of the academic year will not be allowed to progress to the next academic year or be issued a degree.

### 5. *Financial Aid and Tuition*

*Will financial aid be offered?*

☒ Yes (If yes, indicate in detail below how this will be managed.)

☐ No

There are no plans for merit-based aid at this time but all students may seek financial aid through the Office of Student Financial Planning.

The MPHS program will accept up to five WUSM medical students who will receive tuition remission in Years 1 and 2. (Note: We anticipate fewer medical student applicants/matriculated medical students in Year 1 due to time constraints.) In subsequent years, this number will increase to ten per year. Eligibility and candidacy for these limited slots will be determined by the admissions committee and will be based on academic, professional, and service accomplishments as well as personal essays.

*What is the proposed tuition rate?* \$1000 per credit hour

*Will the tuition rate be frozen at matriculation?* ☒ Yes ☐ No

*Describe how the tuition rate was established.*



## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

The MPHS tuition rate was established following a review of associated costs for other graduate programs at Washington University (e.g., MSCI) and one year Masters degree programs for Physicians at comparable private institutions (e.g., JHU, Harvard). The rate of \$1,000 per credit hour allows WU to be competitive from the perspective of prospective students as well as fiscally responsible in terms of gaining program self-sufficiency within three years.

Tuition rates will not increase above the amount set at the time of enrollment, assuming continuous full-time enrollment. Full-time tuition includes student health, life, and disability coverage through WUSM. Health insurance is required and offered through the Office of Student Health Services (see Question 7(c) below).

Additional charges include one-time matriculation and graduation fees at \$150.00 each.

### 6. *Operational Support Staff*

Until a Program Administrator and support staff have been hired, all administrative functions related to the MPHS program will be handled by:

|                     |                 |
|---------------------|-----------------|
| Courtney Beers, MPH | Carol Leighton  |
| Campus Box 8100     | Campus Box 8100 |
| (314) 454-7998      | (314) 454 -7940 |

Program administration will be coordinated with assistance and training from the MSCI program administrator who has agreed to share forms, procedures, best practices, and system efficiencies for program management.

### 7. *Describe policies of the program listed under Student Affairs, including written materials which will be given to students concerning these matters.*

#### a) *Student advising*

All students will be assigned an advisor based on research interest and expertise.

#### b) *Supervision of research by students (if applicable)*

Not applicable.

#### c) *Health insurance*

All full-time students are required to have health insurance coverage through a Washington University health care policy. Health insurance plans are available for full-time students only (spouses and/or dependents are not eligible) through Student Health Services. Associated costs are covered by full-time tuition. Visit <http://wusmhealth.wustl.edu/> or phone the Student Health Services office at 314-362-3523 for more information regarding available plans.

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

### *d) Disability*

Per University policy, students seeking disability-related accommodations must use the Disabilities Resource Office (located in Cornerstone on the Danforth Campus) and are encouraged to contact them upon admission or once diagnosed (<http://disability.wustl.edu/disabilityResources/index.htm>).

The MPHS Program does not provide evaluation and diagnosis for disabilities. However, students who would like information regarding evaluation and diagnosis of a disability are encouraged to contact the Disabilities Resource office to discuss individual concerns and provide referral for evaluation as necessary.

### *e) Leave policies (family leave, vacation, leave of absence, etc.)*

Students may request a leave of absence for academic or personal reasons by submitting a statement in writing to the Program Director. Such a statement should include indication of the beginning and anticipated ending dates of the leave, and a brief statement of the reason (academic or personal). Requests for leaves of absence must be approved by the Program Director.

Leaves of absence shall be granted for no more than one academic year, but in unusual cases may be renewed by the Program Director for a second year. Students requiring a personal leave of absence for medical reasons must, in addition, submit a letter of support from the student's treating physician for both the leave and return requests.

### *f) Disciplinary actions for non-academic transgressions*

Matters involving possible breaches of professional integrity shall be brought to the attention of the Program Committee. Individual(s) raising concern regarding possible misconduct must inform the Program Director of his/her concern in writing.

Behavior inappropriate to the program includes breaches of personal confidence and trust including cheating or unauthorized use of materials during examinations; abuse, misrepresentations or other seriously improper conduct in relation to patients, faculty, staff, or colleagues; and other misconduct, misrepresentation or failure in personal actions or in meeting obligations. Concerns will be held confidential and reviewed by the Program Committee. The Program Committee's decision will be communicated to the informant and/or student (when appropriate) in writing. Instances when the Program Committee is unable to make a determination or when the informant appeals the Program Committee's decision will be handled according to the process of appeals described in Section 1, Question 10.

If an involuntary leave of absence is imposed, the suspending authority shall prepare a written notice of the imposition and shall have the notice mailed certified or personally presented to the student. The written notice shall include a brief statement

## DEVELOPMENT OF NEW DEGREE GRANTING PROGRAMS

of the reasons therefore, and a brief statement of the procedures provided for resolving cases of involuntary leave of absence under these rules.

The student shall be given an opportunity to appear personally before the suspending authority within five (5) business days from the date of service of the notice of imposition of the involuntary leave of absence. If the student asks to appear personally before the suspending authority, only the following issues shall be considered:

- Whether the suspending authority's information concerning the student's conduct is reliable; and
- Whether under all the circumstances, there is a reasonable basis for believing that the continued presence of the student on campus poses a substantial threat to the student, or to the rights, of others to engage in their normal University functions and activities.

Within one week of the date of imposition of the involuntary leave of absence, the suspending authority shall either file a statement of charges against the student with the University Judicial Board and shall have the statement or charges served by mail or personal service upon the student and the Dean of the school or college or Director of the program in which the student is enrolled, or initiate proceedings under these rules to convene a Disciplinary Committee.

A temporary suspension shall end when (i) rescinded by the suspending authority, or (ii) there is a failure of the suspending authority to promptly file a statement of charges with the University Judicial Board or a Disciplinary Committee, or (iii) the case is heard and decided by the University Judicial Board or the Disciplinary Committee. Return of students from involuntary leave of absence requires clearance from the Director of the Student Health Service, the Associate Dean for Student Affairs, and the MPHS Program Director.

*g) Privileges for library access, identification cards, housing, parking, etc.* Students will receive Washington University identification cards to allow access to resources and privileges such as WU libraries, computer labs, and campus parking. Housing accommodations will not be provided through the MPHS program.

## Appendix

## **Master of Population Health Sciences (MPHS)**

### **Goals**

The goals of the one-year masters program for clinicians (MPHS) are:

- ❖ to provide training in population health and clinical investigation research to qualified health professionals and to other individuals whose prior doctoral training and experience has made them capable of playing a leadership role in public health;
- ❖ to adapt training to the anticipated future careers of students;
- ❖ To award the Masters degree to individuals who have acquired a particular depth of knowledge in quantitative methods and health sciences research methods, and who have demonstrated the following capacities to:
  1. understand the distribution of major determinants of health in populations relevant to the candidate's anticipated career course,
  2. apply quantitative methods to current problems in clinical medicine and public health,
  3. analyze risks and devise strategies for a healthier environment, fewer side effects and medical errors,
  4. effectively contribute to the management of health services through evidence based guidelines and effective practices,
  5. identify ways in which changes in behavior and social structures may affect the health of populations,
  6. understand methods to design, implement and evaluate strategies to improve clinical and preventive services (speeding translation from research to practice)
- ❖ To lead students to achieve these capacities in a setting that demands that the students query, learn, persuade, and communicate in active interchange with their peers, with faculty, and with practitioners outside the school.
- ❖ To train physician in the skills needed to lead research programs, clinical departments and institutions

## Overall Competencies:

- Develop and implement a research or public health practice project by applying principles of program evaluation or study design, and the application of appropriate data analytic techniques in an area of public health or clinical significance chosen by the student.
- Develop the knowledge and skills to design, implement, and evaluate epidemiologic, health services or clinical research projects of clinical or public health significance including:
  - i. Employ measures of health and disease status encountered in epidemiologic research, health services research and public health research and practice.
  - ii. Accurately and effectively employ methods for the design, analysis and interpretation of observational studies including cohort and case-control studies.
  - iii. Define and recognize issues of exposure and disease risk, time-dependent effects, confounding, and misclassification.
  - iv. Effectively utilize methods for instrument development, assessment of reliability, validity and responsiveness to change; and/or diagnostic and screening test evaluation.
  - v. Apply epidemiological methods to the study of infectious and non-infectious acute and chronic diseases and their prevention.
- Develop the knowledge and skills with biostatistical methods and computer software packages (e.g. STATA or SAS) for performing appropriate crude and adjusted analyses of public health, health services or clinical data, including methods or regression analysis including the ability to formulate a scientific question in terms of a statistical model, leading to quantitative answers.
- Develop the knowledge and skills with the definitions and basic issues involved in clinical trials including study design, treatment allocation, randomization and stratification, quality control, sample size requirements, patient consent, and interpretation of results. Present for critique and discussion the scientific, policy, and management aspects of clinical trials.
- Apply the principles of meta-analytic statistical methods for clinical trials and observational studies to quantitatively summarize existing data to answer questions of public health or clinical significance.
- Understand the development, implementation, and evaluation of guidelines
- Apply principles of study design and evaluation to T2 research and implementation projects.
- Demonstrate basic ethics as per responsible conduct of research guidelines.

## **Draft MPHS Syllabi**

The draft syllabi include proposed course master, course description, evaluation, competencies and topic list. Draft syllabi are included for the following courses:

1. Introduction to Epidemiology
2. Intermediate Epidemiology
3. Applied Epidemiology
4. Principles of Screening
5. Randomized Controlled Trials
6. Systematic Reviews and Meta-Analysis in Public Health and Clinical Medicine
7. Decision Analysis (2 versions: weekend or 16 session course)

## **Introduction to Epidemiology**

**Instructor:** Lauren Arnold, PhD, MPH

**Course Description:** This course introduces the basic principles and methods of epidemiology, with an emphasis on critical thinking, analytic skills, and application to clinical practice. Topics include outcome measures, methods of adjustment, surveillance, quantitative study designs, and sources of data. Designed for those with a clinical background, the course will provide tools for critically evaluating the literature and skills to practice evidence-based medicine.

**Course Evaluation:** Midterm and final exams, class participation, problem sets, and papers.

### **Course Objectives:**

To become familiar with epidemiologic terminology, outcome measures, and study designs; to appreciate application of epidemiology to subfields (e.g., infectious diseases, reproductive health, genetics); and to apply epidemiologic methods to current public health issues.

### **Competencies:**

1. Understand the criteria commonly used to evaluate causal relationships.
2. Evaluate the quality and comparability of data.
3. Understand the major study designs for obtaining quantitative information relevant to population health research questions from surveillance, observational, community-based and controlled trial research studies and be able to select the most appropriate design for different hypotheses.
4. Define exposure variables, outcome variables, extraneous variables and measures of their frequency.
5. Understand and calculate commonly used health measures, such as relative risk, attributable risk, relative hazards, odds ratio, and select appropriate methods for estimating such measures.
6. Define appropriate comparison groups for epidemiologic studies.
7. Interpret descriptive and inferential statistics resulting from data analysis and draw relevant conclusions.
8. Apply the concepts of confounding, effect modification and bias to describe variables and be able to describe appropriate methods for addressing each.
9. Critique the study design and quantitative methods used in published literature and appropriately interpret the findings.
10. Identify key sources of epidemiologic data
11. Describe a public health problem in terms of magnitude, person, time and place
12. Formulate and apply epidemiologic methodology to identify a specific public health problem, develop a hypothesis, and design a study to investigate the issue.



## Introduction to Epidemiology

| <b>Class</b>    | <b>Topic</b>                      |
|-----------------|-----------------------------------|
| <b>Class 1</b>  | Causation                         |
| <b>Class 2</b>  | Measuring disease occurrence      |
| <b>Class 3</b>  | Surveillance                      |
| <b>Class 4</b>  | Standardization                   |
| <b>Class 5</b>  | Hypothesis testing & significance |
| <b>Class 6</b>  | Data sources & secondary analyses |
| <b>Class 7</b>  | Bias & confounding                |
| <b>Class 8</b>  | Descriptive studies               |
| <b>Class 9</b>  | Midterm exam                      |
| <b>Class 10</b> | Cohort studies                    |
| <b>Class 11</b> | Intervention studies              |
| <b>Class 12</b> | Case control studies              |
| <b>Class 13</b> | Infectious disease epi            |
| <b>Class 14</b> | Environmental & occupational epi  |
| <b>Class 15</b> | Genetic/molecular epi             |
| <b>Class 16</b> | Final exam                        |

## **Intermediate Epidemiology**

**Instructor:** Mario Schootman, PhD

**Course Description:** The second course in the Epidemiology series, this course builds upon the basic principles and methods of epidemiology and introduces additional tools and concepts that are critical to a comprehensive study design. Topics include risk and association, sampling strategies, interaction, confounding, adjustment, lifetables, applied causal inference, validity and reliability, social epidemiology, and approaches to data analysis. Upon exiting this course, students will be prepared to approach the study design portion of a protocol, as required by the final course in the Epidemiology series.

**Course Evaluation:** Midterm and final exams, in-class exercises, and problem sets.

### **Course Objectives:**

To apply epidemiologic methods to case studies; to recognize bias, confounding, and interaction in studies and learn methods to address these concerns in the design and analysis phases of research; and to identify appropriate

### **Competencies:**

1. Understand the criteria commonly used to evaluate causal relationships.
2. Evaluate the quality and comparability of data.
3. Understand the major study designs for obtaining quantitative information relevant to population health research questions from surveillance, observational, community-based and controlled trial research studies and be able to select the most appropriate design for different hypotheses.
4. Define exposure variables, outcome variables, extraneous variables and measures of their frequency.
5. Understand and calculate commonly used health measures, such as relative risk, attributable risk, relative hazards, odds ratio, and select appropriate methods for estimating such measures.
6. Define appropriate comparison groups for epidemiologic studies.
7. Interpret descriptive and inferential statistics resulting from data analysis and draw relevant conclusions.
8. Apply the concepts of confounding, effect modification and bias to describe variables and be able to describe appropriate methods for addressing each.
9. Critique the study design and quantitative methods used in published literature and appropriately interpret the findings.
10. Identify key sources of epidemiologic data
11. Describe a public health problem in terms of magnitude, person, time and place
12. Formulate and apply epidemiologic methodology to identify a specific public health problem, develop a hypothesis, and design a study to investigate the issue.

## Intermediate Epidemiology

| Week     | Topic  |
|----------|--|
| Class 1  | Measures of risk   |
| Class 2  | Measures of association                                    |
| Class 3  | Lifetables and Kaplan Meier Curves                         |
| Class 4  | Causation  |
| Class 5  | Bias/confounding   |
| Class 6  | Bias case study  |
| Class 7  | Sample strategies in case control, cohort, and RCT studies |
| Class 8  | Midterm  |
| Class 9  | Interactions   |
| Class 10 | Adjustment, mediation, model building                      |
| Class 11 | Applied causal inference                                   |
| Class 12 | Validity and reliability                                   |
| Class 13 | Screening: PPV/N, sensitivity, specificity                 |
| Class 14 | Modern Methods I: Multilevel Analysis, Social Epidemiology |
| Class 15 | Modern Methods II: GWAS, Causal Diagrams                   |
| Class 16 | Final exam   |

## **Applied Epidemiology**

**Instructor:** Kathleen Wolin, ScD

**Description:** The final course in the epidemiologic methods course sequence, this course provides students the opportunity to apply the methods and principles learned previously to a specific research problem of their own choosing. This course is designed to provide students with an understanding of the processes involved in applying their training to the design and conduct of research. Students will prepare a research grant application in the format expected for a National Institutes of Health R03/R21 grant application. Students will also learn how other organizations differ in their grant application process, with particular attention to AHRQ. The course offers students the opportunity to critically evaluate scientific research proposals for scientific merit.

**Format:** Lectures, class discussion, presentation and review of an individual grant.

**Evaluation:** 40% grant proposal development and submission; 20% presentation of grant proposal; 30% written critique of a grant proposal; 10% class participation

**Competencies:**

1. Apply epidemiologic methods to a research question of interest
2. Be familiar with the key principles in developing a grant application for submission to NIH or other similar funding agencies including content, format and style
3. Be familiar with the NIH grant review process
4. Be able to present grant proposal to a body of peers for feedback
5. Be able to conduct a critical review of a grant according to NIH procedures and scoring and partake in constructive discussions with other reviewers to reach a consensus on a priority score for funding.

## Applied Epidemiology

| <b>Week</b> | <b>Topic</b>   |
|-------------|--|
| Week 1      | Overview of the NIH grant format: specific aims, significance, innovation, approach.<br>Overview of AHRQ and other agency formats  |
| Week 2      | Overview of review process: How a grant gets reviewed; review criteria; use of appropriate language  |
| Week 3-7    | Drafting of grant proposals.<br>Course instructors are available for individual discussions during class time. Students are expected to be meeting regularly with their mentors during this time to develop the proposal               |
| Week 4      | Draft aims due to course instructors for preliminary review. Your mentor should have signed off on these <b>BEFORE</b> you submit them   |
| Week 8      | Grant proposals due.<br>Students will be assigned 2 peers to provide detailed written critiques, one as primary and one as secondary reviewer. Students are expected to read and be prepared to discuss all proposals                  |
| Week 9      | Written critiques due.   |
| Week 9-16   | Mock study sections – Students will give a 20 minute presentation overview of their study proposal for the class. Two students providing written critiques will provide critique. Course instructors will provide additional feedback. |

## **Principles of Screening**

**Instructor:** Jean Wang, MD, PhD

**Contributing Faculty:** Graham Colditz, MD, DrPH, Pamela Owens, MD

**Description:** The aim of this course is to provide a basic understanding of the principles of population screening. Emphasis is placed on screening from a public health perspective. We will review current approaches to screening for cancer as well as applications in a number of other settings. Controversies and limitations on screening strategies will be discussed. Preventive Service Task Force Guidelines and approaches to developing evidence based recommendations for screening will be reviewed. Strategies to evaluation of program effectiveness will be considered.

**Competencies:** The framework for screening program evaluation underpinning course competencies includes:

1. Recognizing and defining the scientific components of screening, including:
  - Validity and reliability of test
  - Natural history of disease
  - Effective treatment available
2. Recognizing and defining the ethical components of screening, including:
  - Does treatment prolong life (lead time, length bias)
  - Program acceptability to target population
3. Recognizing and defining the economic components of screening, including:
  - Affordability of false positives
  - Affordability of follow-up of positive patients
  - Cost-effectiveness of the program

**Evaluation:** 25% Problem set, 75% 8-10 page paper/commentary on timely pre-approved screening topic not covered in course

### **Optional Texts:**

Guide to Clinical Preventive Services, second edition. Report of the U.S. Preventive Services Task Force, Baltimore, 1996, Williams & Wilkins. (And on line)

Morrison, Alan S. Screening in Chronic Disease (second edition). New York: Oxford University Press, 1992

## Principles of Screening

| WEEK     | TOPIC   |
|----------|---|
| Class 1  | Introduction/Overview of Course & History of Screening  |
| Class 2  | Quantitative concepts: effects of screening on incidence and mortality: sensitivity, specificity, serendipity |
| Class 3  | Case/control studies of screening   |
| Class 4  | Evaluation of Screening: Statistical Approaches   |
| Class 5  | Genetics and Ethics: Workplace Issues and Beyond<br>Ethical Issues in Genetic Screening                       |
| Class 6  | Communicating About Screening   |
| Class 7  | Evaluating duration of protection: Cervical Cancer Screening  |
| Class 8  | Evaluating program implementation: Colorectal Cancer  |
| Class 9  | False positives vs true positives – making trade offs: Breast Cancer Screening                                |
| Class 10 | Topic TBD   |
| Class 11 | Cost effectiveness and time trade off issues: Cardiovascular Disease Screening                                |
| Class 12 | Lead time, study endpoints & need for effective treatment: Lung Cancer Screening                              |
| Class 13 | Large Trial Example: PLCO Prevention Trial  |
| Class 14 | ROC curves and biomarkers: Predictive value of CRP and blood glucose  |
| Class 15 | PPV and diagnostic follow-up burden: Ovarian Cancer Screening   |
| Class 16 | Screening in the context of disease prevention  |



## **Randomized Controlled Trials**

**Instructor:** Graham Colditz, MD, DrPH and guest speakers

**Description:** This course provides a comprehensive introduction to randomized controlled clinical trials. Topics include types of clinical trials research (efficacy and effectiveness trials), study design, treatment allocation, randomization and stratification, quality control, analysis, sample size requirements, patient consent, data safety and monitoring plans, reporting standards, and interpretation of results.

**Evaluation:** Students design a clinical investigation protocol in their own field of interest, write a proposal for it, and critique recently published medical literature.

### **Competencies:**

1. Ability to design randomized controlled trial
  - Define research question
  - Understand efficacy and effectiveness trials, their differences and implications for clinical practice
  - Define study population and estimate sample size
  - Define approaches for recruitment strategy, randomization, and blinding
  - Apply eligibility criteria and recording of recruitment adequate for trial reports
  - Develop data collection plan for primary endpoint, secondary endpoint, covariates and adverse events and implement data quality monitoring
  - Apply strategies for monitoring trial adherence
2. Skills and experience to conduct analysis of RCT
  - Master data analysis and model fitting in context of RCT
  - Conduct survival analysis
  - Apply principles of interim analysis and stopping rules
  - Apply principles for subgroup analysis
  - Apply principles for per protocol analysis
  - Understand design and implementation issues in conduct of multicenter trials
3. Master the core reporting strategies
  - Master reporting standards for RCTs following Consort and Extended Consort approaches
  - Master development of reports for data safety monitoring board
  - Understand issues pertaining to FDA standards for reporting
4. Draw inferences from data to inform clinical and public health practices
  - Correctly use reasoning for design and methodologies employed
  - Interpret Adverse Events in context of biology and study design
  - Interpret subgroup analyses in context of biology, disease process and public health practices
  - Present oral and written reports from analyses
  - Place inference in context of clinical and public health implications for action and future research

## Randomized Controlled Trials

| Week     | Topic  |
|----------|--|
| Class 1  | Overview – the role of RCTs in evaluating medical and public health intervention |
| Class 2  | Population definitions: Efficacy vs. Effectiveness, Eligibility, & Recruitment   |
| Class 3  | Consent & IRB  |
| Class 4  | Sample size & stopping rules   |
| Class 5  | Randomization  |
| Class 6  | Baseline data collection   |
| Class 7  | Adherence to intervention  |
| Class 8  | Data quality   |
| Class 9  | Follow-up & SAEs   |
| Class 10 | Analysis – main hypothesis, secondary and subgroup analysis                      |
| Class 11 | Per protocol analysis  |
| Class 12 | Data safety and monitoring   |
| Class 13 | Managing multi-center trials   |
| Class 14 | Reporting CONSORT & EXTENDED consort   |
| Class 15 | Protocol presentations/Mock IRB session  |
| Class 16 | Protocol presentations/Mock IRB session  |

## **Systematic Reviews and Meta-Analysis in Public Health and Clinical Medicine**

**Instructor:** Graham A. Colditz, MD, DrPH and guests.

**Course Description:** Introduction to the use of meta-analysis and related methods used to synthesize and evaluate epidemiological and clinical research in public health and clinical medicine. Concepts introduced and illustrated through case studies of public health and medical issues.

**Course Objectives:** To learn how to use a variety of formal and informal methods for synthesizing epidemiological information on public health risks, to understand how to use these methods to assess the strength of the evidence in policy development and clinical contexts, and to appreciate how research synthesis can contribute to rational policy making in controversial areas.

**Readings:** The primary text for the course is *Systematic Reviews in Health Care: Meta-analysis in Context*, 2<sup>nd</sup> Edition, Matthias Egger, George Davey Smith, and Douglas Altman, eds., BMJ Books, 2001. Supplemental readings from *Introduction to Meta-Analysis*, Michael Borenstein, Larry V Hedges, Julian PT Higgins, and Hannah R Rothstein, Wiley, 2009, are also given. Additional readings are indicated below and will be available through course ????

### **Class schedule:**

Most classes will involve case discussions, and students are expected to come to class prepared to discuss the readings. On one day, the class will meet in the computer lab in to review the use of Comprehensive Meta Analysis or STATA.

Students (working in groups) will present their work according to the following schedule:

- A. : Study protocol: precise topic, search strategy, inclusion/exclusion criteria.
- B. : Search results, evidence table, statistical issues.
- Last 2 days of class: Final presentation of results and conclusions.

**Evaluation:** Working in groups of 3 to 5 individuals, students will be expected to carry out a written research synthesis of a public health or clinical topic of their own choosing. Intermediate results will be presented and discussed in class. Grades will be based on the written paper, presentations, and on class participation. The content of the written paper should be based on the QUORUM or MOOSE consensus statement as appropriate.

- Moher D, et al, Quality of reporting of meta-analyses (QUORUM) consensus statement, *Lancet* 1999, 354:1896-1900.
- Stroup DF, et al, Meta-analysis of observational studies in epidemiology (MOOSE) consensus statement, *JAMA* 2000, 283:2008-2012.

**Software:** We will be using specialized meta-analysis software in the course this year, Comprehensive Meta-Analysis, Version 2.0. It is available for purchase at a special rate of \$95 for a one-year lease for students in this course. See the order form posted on the CMA page of the Course Gateway. Stata, a general purpose statistical software program, also does meta-analysis well. For those who do not wish to lease CMA, there is information on using Stata posted in the Data and Stata page of the Course Gateway.

## **Competencies:**

1. Be able to design research synthesis and meta-analysis
  - Define research question
  - Define literature search strategy
  - Conduct literature search and document the process
  - Apply eligibility criteria, data extraction, and data quality scoring
  - Develop data analysis plan
  - Understand and interpret fixed-effects, random-effects, and meta-regression methods and results
  - Recognize heterogeneity and approaches to quantification and reporting of among-study variation
2. Demonstrate skills and experience to conduct analysis
  - Master data analysis and model fitting in context of meta-analysis
  - Quantitatively evaluate publication bias
  - Be able to estimate combined results from reports of randomized trials, observational studies, and diagnostic test
3. Master the core reporting strategies
  - Master reporting standards for RCTs and observational data in context of meta-analysis
  - Master forest plot, summary tables, and publication bias presentations
4. Draw inferences from data to inform clinical and public health practices
  - Correctly use reasoning for design and methodologies employed
  - Present oral and written reports from analyses
  - Place inference in context of clinical and public health implications for action and future research

## Systematic Reviews and Meta-Analysis in Public Health and Clinical Medicine

| <b>Class</b>    | <b>Topic</b>   |
|-----------------|--|
| <b>Class 1</b>  | Introduction   |
| <b>Class 2</b>  | Searching the literature; BCG  |
| <b>Class 3</b>  | Statistical methods: effect sizes, basic meta-analysis calculations; BCG   |
| <b>Class 4</b>  | Statistical methods, continued: cumulative meta-analysis, tools for publication bias; BCG                          |
| <b>Class 5</b>  | Student presentations: Topic and search protocol   |
| <b>Class 6</b>  | Heterogeneity I: $I^2$ , subgroup analysis; ETS, HIV counselling & testing NAC                                     |
| <b>Class 7</b>  | Quality scores: application to research synthesis<br>Introduction to Comprehensive Meta Analysis Version 2.0       |
| <b>Class 8</b>  | Heterogeneity II: Meta-regression; BCG, ETS, Alcohol and stroke, Vitamin E   |
| <b>Class 9</b>  | Environmental epidemiology examples: ETS and EMF   |
| <b>Class 10</b> | Student presentations: Results of literature search and preliminary results  |
| <b>Class 11</b> | Drug safety  |
| <b>Class 12</b> | Computer lab   |
| <b>Class 13</b> | Combining diagnostic test results<br>Example, Diagnostic tests: Exercise testing to detect coronary artery disease |
| <b>Class 14</b> | Comparing meta-analysis of published results with pooled analysis of individual level data                         |
| <b>Class 15</b> | Student presentations: Summary and final results   |
| <b>Class 16</b> | Student presentations: Summary and final results   |

# **Decision Analysis for Clinical Investigation and Economic Evaluation**

**Course Instructor:** Steven Kymes, Ph.D., M.H.A.

**Description:** This course will introduce the methods and applications of decision analysis and cost-effectiveness analysis in health care technology assessment, medical decision making, and health resource allocation. Among the topics covered are the development of a research question, choice of decision perspective, development of a decision analytic model, estimation of costs and benefits, use of preference based measures, addressing uncertainty and preparation of a manuscript presenting a decision analytic study.

**Evaluation:** Grades will be based upon a class project that will be presented as both a class presentation and a final paper as follows: project description (10%); oral presentation (30%); final paper (60%)

## **Course Project:**

Each student will identify a project that will involve development of a decision model. This might be a clinical decision question that requires maximization of a preferred outcome, or an economic evaluation project. Students are encouraged to consider questions that are related to their research or clinical interests. A description of the project along with a review of the pertinent literature will be due at the beginning of the first class on the second weekend. An oral presentation of the project will be presented during the Sunday session the last weekend of class. The completed project report, in the form of a submission quality manuscript (along with a descriptive technical appendix) will be due no later than 5:00 PM on the second Friday after the oral presentation.

## **Competencies:**

1. Apply the theoretical basis for economic evaluation and decision analysis to a current topic in population health
2. Develop a decision model for a topic relevant to one's career/clinical goals
3. Conduct a decision analysis microsimulation using TreeAge software

## **Required Readings:**

1. Michael Drummond, et al, **Methods for the Economic Evaluation of Health Care Programmes**. Oxford Press, 2005
2. Ralph L. Keeney, Howard Raiffa, **Decisions with Multiple Objectives**. Cambridge University Press, 1993
3. TreeAge software (Williamstown MA) will be provided to all class members at no charge.
4. Additional readings will be assigned.

## **Recommended readings:**

Andrew Briggs et al., **Decision Modeling for Health Economic Evaluation**. Oxford Press, 2008.

## Decision Analysis for Clinical Investigation and Economic Evaluation

| <b>Week</b>                           | <b>Session</b> | <b>Topic</b>   |
|---------------------------------------|----------------|--|
| <b>Weekend #1:<br/>Day #1 (½ day)</b> | Session #1     | Making choices—the decision making paradigm  |
|                                       | Session #2     | The theoretical basis of economic evaluation   |
| <b>Weekend #1:<br/>Day #2</b>         | Session #3     | Development of a research question in decision analysis                                    |
|                                       | Session #4     | Choosing the type of analysis to be conducted  |
|                                       | Session #5     | Identifying data sources and systematic reviews  |
|                                       | Session #6     | Assessment of preference based measures  |
| <b>Weekend #2:<br/>Day #1</b>         | Session #7     | Measurement of patient related outcomes (PROs)   |
|                                       | Session #8     | PROs (cont)  |
|                                       | Session #9     | Measuring costs in economic evaluation   |
|                                       | Session #10    | Building decision models, from simple to microsimulation                                   |
| <b>Weekend #2:<br/>Day #2</b>         | Session #11    | Addressing uncertainty in decision analysis and economic evaluation                        |
|                                       | Session #12    | Expected Value of Perfect Information (EVPI)   |
|                                       | Session #13    | The basics of TreeAge  |
|                                       | Session #14    | TreeAge Lab #1   |
| <b>Weekend #3:<br/>Day #1</b>         | Session #15    | Modeling chronic diseases in decision analytic models                                      |
|                                       | Session #16    | Reporting standards for decision analysis and economic evaluation studies                  |
|                                       | Session #17    | Microsimulation, tracker variables and EVPI studies in TreeAge                             |
|                                       | Session #18    | TreeAge Lab #2   |
| <b>Weekend #3:<br/>Day #2</b>         | Session #19    | Conjoint analysis and preference assessment  |
|                                       | Session #20    | Decision analysis, economic evaluation and health policy<br>Presentation of class projects |

***Class paper due 2 weeks following last class session***



## **Decision Analysis for Clinical Investigation and Economic Evaluation: Version 2**

**Course Instructor:** Steven Kymes, Ph.D., M.H.A.

**Description:** This course will introduce the methods and applications of decision analysis and cost-effectiveness analysis in health care technology assessment, medical decision making, and health resource allocation. Among the topics covered are the development of a research question, choice of decision perspective, development of a decision analytic model, estimation of costs and benefits, use of preference based measures, addressing uncertainty and preparation of a manuscript presenting a decision analytic study.

**Evaluation:** Grades will be based upon a class project that will be presented as both a class presentation and a final paper as follows: project description (10%); oral presentation (30%); final paper (60%).

### **Course Project:**

Each student will identify a project that will involve development of a decision model. This might be a clinical decision question that requires maximization of a preferred outcome, or an economic evaluation project. Students are encouraged to consider questions that are related to their research or clinical interests. A description of the project along with a review of the pertinent literature will be due at the beginning of the first class on the second weekend. An oral presentation of the project will be presented during the Sunday session the last weekend of class. The completed project report, in the form of a submission quality manuscript (along with a descriptive technical appendix) will be due no later than 5:00 PM on the second Friday after the oral presentation.

### **Competencies:**

1. Apply the theoretical basis for economic evaluation and decision analysis to a current topic in population health
2. Develop a decision model for a topic relevant to one's career/clinical goals
3. Conduct a decision analysis microsimulation using TreeAge software

### **Required Readings:**

1. Michael Drummond, et al, **Methods for the Economic Evaluation of Health Care Programmes**. Oxford Press, 2005
2. Ralph L. Keeney, Howard Raiffa, **Decisions with Multiple Objectives**. Cambridge University Press, 1993
3. TreeAge software (Williamstown MA) will be provided to all class members at no charge.
4. Additional readings will be assigned.

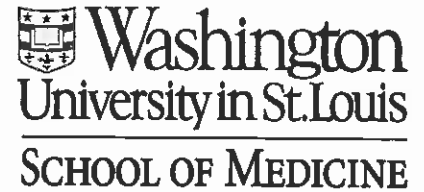
### **Recommended readings:**

Andrew Briggs et al., **Decision Modeling for Health Economic Evaluation**. Oxford Press, 2008.

## **Decision Analysis for Clinical Investigation and Economic Evaluation: Version 2**

| <b>Week</b>     | <b>Topic</b>  |
|-----------------|---|
| <b>Class 1</b>  | Making choices—the decision making paradigm   |
| <b>Class 2</b>  | The theoretical basis of economic evaluation  |
| <b>Class 3</b>  | Development of a research question in decision analysis   |
| <b>Class 4</b>  | Choosing the type of analysis to be conducted<br>Identifying data sources and systematic reviews        |
| <b>Class 5</b>  | Assessment of preference based measures   |
| <b>Class 6</b>  | Measurement of patient related outcomes (PROs)  |
| <b>Class 7</b>  | Measuring costs in economic evaluation  |
| <b>Class 8</b>  | Building decision models, from simple to microsimulation  |
| <b>Class 9</b>  | Addressing uncertainty in decision analysis and economic evaluation                                     |
| <b>Class 10</b> | Expected Value of Perfect Information (EVPI)  |
| <b>Class 11</b> | The basics of TreeAge   |
| <b>Class 12</b> | Modeling chronic diseases in decision analytic models   |
| <b>Class 13</b> | Reporting standards for decision analysis and economic evaluation studies                               |
| <b>Class 14</b> | Microsimulation, tracker variables and EVPI studies in TreeAge  |
| <b>Class 15</b> | Conjoint analysis and preference assessment<br>Decision analysis, economic evaluation and health policy |
| <b>Class 16</b> | Oral presentations  |

## Student Application for Enrollment Fall 2010



|                            |   |  |  |  |  |
|----------------------------|---|--|--|--|--|
| Last Name                  |   | First  |  | Middle   |  |
| Street Address             |   |  |  | City   |  |
| State                      |   | ZIP  |  | Country  |  |
| Day Phone                  |   | Evening Phone  |  | Email Address  |  |
| Social Security #          |   | Date of Birth  |  | <u>Current status check all that apply:</u><br><input type="checkbox"/> Medical or Allied Health Student<br><input type="checkbox"/> Physician <input type="checkbox"/> Faculty<br><input type="checkbox"/> Other (specify): _____ |  |
| United States (US) Citizen | YES <input type="checkbox"/><br>NO <input type="checkbox"/> | If no, are you a permanent US resident?<br>If no, are you a US non-citizen national? | YES <input type="checkbox"/><br>YES <input type="checkbox"/> | NO <input type="checkbox"/><br>NO <input type="checkbox"/>   | <input type="checkbox"/> Resident<br><input type="checkbox"/> Fellow |

*List all colleges, universities, and professional schools attended with the most recent/current institution first.*

| Institution Name                           | City, State       | Dates of Attendance | Degree/Major        | Date awarded or expected |
|--|-------------------|---------------------|---------------------|--------------------------|
| University of California, Berkeley         | Berkeley, CA      | 1962-1964           | B.S. in Chemistry   | 1964                     |
| Massachusetts Institute of Technology      | Cambridge, MA     | 1964-1966           | Ph.D. in Chemistry  | 1966                     |
| Harvard University                         | Cambridge, MA     | 1966-1968           | Postdoctoral Fellow | 1968                     |
| Stanford University                        | Stanford, CA      | 1968-1970           | Postdoctoral Fellow | 1970                     |
| University of Texas at Austin              | Austin, TX        | 1970-1972           | Postdoctoral Fellow | 1972                     |
| University of Illinois at Urbana-Champaign | Urbana, IL        | 1972-1974           | Postdoctoral Fellow | 1974                     |
| University of Wisconsin-Madison            | Madison, WI       | 1974-1976           | Postdoctoral Fellow | 1976                     |
| University of Michigan                     | Ann Arbor, MI     | 1976-1978           | Postdoctoral Fellow | 1978                     |
| University of California, San Diego        | San Diego, CA     | 1978-1980           | Postdoctoral Fellow | 1980                     |
| University of Washington                   | Seattle, WA       | 1980-1982           | Postdoctoral Fellow | 1982                     |
| University of Texas at Dallas              | Dallas, TX        | 1982-1984           | Postdoctoral Fellow | 1984                     |
| University of California, Los Angeles      | Los Angeles, CA   | 1984-1986           | Postdoctoral Fellow | 1986                     |
| University of California, Santa Barbara    | Santa Barbara, CA | 1986-1988           | Postdoctoral Fellow | 1988                     |
| University of California, Irvine           | Irvine, CA        | 1988-1990           | Postdoctoral Fellow | 1990                     |
| University of California, San Francisco    | San Francisco, CA | 1990-1992           | Postdoctoral Fellow | 1992                     |
| University of California, Davis            | Davis, CA         | 1992-1994           | Postdoctoral Fellow | 1994                     |
| University of California, Merced           | Merced, CA        | 1994-1996           | Postdoctoral Fellow | 1996                     |
| University of California, Riverside        | Riverside, CA     | 1996-1998           | Postdoctoral Fellow | 1998                     |
| University of California, San Diego        | San Diego, CA     | 1998-2000           | Postdoctoral Fellow | 2000                     |
| University of California, San Diego        | San Diego, CA     | 2000-2002           | Postdoctoral Fellow | 2002                     |
| University of California, San Diego        | San Diego, CA     | 2002-2004           | Postdoctoral Fellow | 2004                     |
| University of California, San Diego        | San Diego, CA     | 2004-2006           | Postdoctoral Fellow | 2006                     |
| University of California, San Diego        | San Diego, CA     | 2006-2008           | Postdoctoral Fellow | 2008                     |
| University of California, San Diego        | San Diego, CA     | 2008-2010           | Postdoctoral Fellow | 2010                     |
| University of California, San Diego        | San Diego, CA     | 2010-2012           | Postdoctoral Fellow | 2012                     |
| University of California, San Diego        | San Diego, CA     | 2012-2014           | Postdoctoral Fellow | 2014                     |
| University of California, San Diego        | San Diego, CA     | 2014-2016           | Postdoctoral Fellow | 2016                     |
| University of California, San Diego        | San Diego, CA     | 2016-2018           | Postdoctoral Fellow | 2018                     |
| University of California, San Diego        | San Diego, CA     | 2018-2020           | Postdoctoral Fellow | 2020                     |
| University of California, San Diego        | San Diego, CA     | 2020-2022           | Postdoctoral Fellow | 2022                     |
| University of California, San Diego        | San Diego, CA     | 2022-2024           | Postdoctoral Fellow | 2024                     |
| University of California, San Diego        | San Diego, CA     | 2024-2026           | Postdoctoral Fellow | 2026                     |
| University of California, San Diego        | San Diego, CA     | 2026-2028           | Postdoctoral Fellow | 2028                     |
| University of California, San Diego        | San Diego, CA     | 2028-2030           | Postdoctoral Fellow | 2030                     |
| University of California, San Diego        | San Diego, CA     | 2030-2032           | Postdoctoral Fellow | 2032                     |
| University of California, San Diego        | San Diego, CA     | 2032-2034           | Postdoctoral Fellow | 2034                     |
| University of California, San Diego        | San Diego, CA     | 2034-2036           | Postdoctoral Fellow | 2036                     |
| University of California, San Diego        | San Diego, CA     | 2036-2038           | Postdoctoral Fellow | 2038                     |
| University of California, San Diego        | San Diego, CA     | 2038-2040           | Postdoctoral Fellow | 2040                     |
| University of California, San Diego        | San Diego, CA     | 2040-2042           | Postdoctoral Fellow | 2042                     |
| University of California, San Diego        | San Diego, CA     | 2042-2044           | Postdoctoral Fellow | 2044                     |
| University of California, San Diego        | San Diego, CA     | 2044-2046           | Postdoctoral Fellow | 2046                     |
| University of California, San Diego        | San Diego, CA     | 2046-2048           | Postdoctoral Fellow | 2048                     |
| University of California, San Diego        | San Diego, CA     | 2048-2050           | Postdoctoral Fellow | 2050                     |
| University of California, San Diego        | San Diego, CA     | 2050-2052           | Postdoctoral Fellow | 2052                     |
| University of California, San Diego        | San Diego, CA     | 2052-2054           | Postdoctoral Fellow | 2054                     |
| University of California, San Diego        | San Diego, CA     | 2054-2056           | Postdoctoral Fellow | 2056                     |
| University of California, San Diego        | San Diego, CA     | 2056-2058           | Postdoctoral Fellow | 2058                     |
| University of California, San Diego        | San Diego, CA     | 2058-2060           | Postdoctoral Fellow | 2060                     |
| University of California, San Diego        | San Diego, CA     | 2060-2062           | Postdoctoral Fellow | 2062                     |
| University of California, San Diego        | San Diego, CA     | 2062-2064           | Postdoctoral Fellow | 2064                     |
| University of California, San Diego        | San Diego, CA     | 2064-2066           | Postdoctoral Fellow | 2066                     |
| University of California, San Diego        | San Diego, CA     | 2066-2068           | Postdoctoral Fellow | 2068                     |
| University of California, San Diego        | San Diego, CA     | 2068-2070           | Postdoctoral Fellow | 2070                     |
| University of California, San Diego        | San Diego, CA     | 2070-2072           | Postdoctoral Fellow | 2072                     |
| University of California, San Diego        | San Diego, CA     | 2072-2074           | Postdoctoral Fellow | 2074                     |
| University of California, San Diego        | San Diego, CA     | 2074-2076           | Postdoctoral Fellow | 2076                     |
| University of California, San Diego        | San Diego, CA     | 2076-2078           | Postdoctoral Fellow | 2078                     |
| University of California, San Diego        | San Diego, CA     | 2078-2080           | Postdoctoral Fellow | 2080                     |
| University of California, San Diego        | San Diego, CA     | 2080-2082           | Postdoctoral Fellow | 2082                     |
| University of California, San Diego        | San Diego, CA     | 2082-2084           | Postdoctoral Fellow | 2084                     |
| University of California, San Diego        | San Diego, CA     | 2084-2086           | Postdoctoral Fellow | 2086                     |
| University of California, San Diego        | San Diego, CA     | 2086-2088           | Postdoctoral Fellow | 2088                     |
| University of California, San Diego        | San Diego, CA     | 2088-2090           | Postdoctoral Fellow | 2090                     |
| University of California, San Diego        | San Diego, CA     | 2090-2092           | Postdoctoral Fellow | 2092                     |
| University of California, San Diego        | San Diego, CA     | 2092-2094           | Postdoctoral Fellow | 2094                     |
| University of California, San Diego        | San Diego, CA     | 2094-2096           | Postdoctoral Fellow | 2096                     |
| University of California, San Diego        | San Diego, CA     | 2096-2098           | Postdoctoral Fellow | 2098                     |
| University of California, San Diego        | San Diego, CA     | 2098-2100           | Postdoctoral Fellow | 2100                     |

*All applicants are expected to submit a one-page essay identifying the area of interest in clinical outcomes research and population health that guides training and course selection if accepted to the program. Essays may not exceed one single-spaced page with no smaller than 11 point font.*

I certify that the information provided in this form and associated attachments are true and complete to the best of my knowledge.

Signature

Date \_\_\_\_\_

## REQUIRED ATTACHMENTS

### RESIDENTS, FELLOWS, PHYSICIANS, & FACULTY

*In addition to the application form, resident, fellows, physicians, and faculty applicants are required to submit:*

|                          |  |              |
|--------------------------|--|--------------|
| <input type="checkbox"/> | Personal statement (as described on Page 1)  | Attachment A |
| <input type="checkbox"/> | Letter of support from departmental leadership (or fellowship training director) documenting allocation of dedicated time to meet course and program requirements. Residents and fellows are expected to demonstrate 80% protected time over a full academic year. | Attachment B |
| <input type="checkbox"/> | International applicants submit documentation of current* TOEFL test results <u>and</u> Current* GRE or MCAT test results  | Attachment C |

### MEDICAL AND ALLIED HEALTH STUDENT APPLICANTS

*In addition to the application form, medical student applicants are required to respond to the following additional questions and submit:*

Are you currently enrolled in another dual-degree program?

YES ☐ NO ☐

Do you currently receive scholarships or other funding for your medical education?

YES ☐ NO ☐

If yes to either question, please describe:

|                          |   |              |
|--------------------------|---|--------------|
| <input type="checkbox"/> | Personal statement (as described on Page 1)   | Attachment A |
| <input type="checkbox"/> | Letter of recommendation from one WUSTL faculty member  | Attachment B |
| <input type="checkbox"/> | Essay describing how the MPHS will complement the student's medical training and how the applicant envisions putting this specialized training to use in his/her career in medicine | Attachment C |
| <input type="checkbox"/> | International applicants submit documentation of current* TOEFL test results <u>and</u> current* GRE or MCAT test results   | Attachment D |

### ALL OTHER APPLICANTS

*In addition to the application form, all other applicants are required to submit:*

|                          |   |              |
|--------------------------|---|--------------|
| <input type="checkbox"/> | Personal statement (as described on Page 1)   | Attachment A |
| <input type="checkbox"/> | Three letters of recommendation reflecting academic and professional accomplishments. At least one letter focused on academic performance/potential.              | Attachment B |
| <input type="checkbox"/> | Current* MCAT or GRE test results   | Attachment C |
| <input type="checkbox"/> | Essay describing how the MPHS will complement the applicant's training and how the applicant envisions putting this specialized training to use in his/her career | Attachment D |
| <input type="checkbox"/> | Documentation of all degrees and official transcripts   | Attachment E |
| <input type="checkbox"/> | International applicants submit documentation of current* TOEFL test results  | Attachment F |

*\*Current is defined as within two years of application date for TOEFL test results, within five years of application date for GRE test results, and within ten years of application date for MCAT test results.*

**(Notification letter template – based on approved GEMS model)**

(date)

(Matriculating Student)  
(Address)

Dear (student):

I am pleased to inform you that the Admissions Committee for the Master of Population Health Sciences (MPHS) program has recommended that you be admitted to our program. Please accept my sincere congratulations on behalf of Dr. Larry Shapiro, Executive Vice Chancellor for Medical Affairs and Dean of the School of Medicine.

You have been selected from among a group of highly qualified applicants. Your admission expresses both our respect for your previous academic achievements, and our confidence that you will become a successful and valued member of the Washington University School of Medicine community, maintaining the high standards characteristic of Washington University.

Formal course work for new students will begin in August of 2010. Enclosed is a schedule of classes for the academic year 2010-2011. Course materials and syllabi will be provided to you at the first class of each course.

Should you accept our offer of admission, please complete and return the attached Statement of Intent to Matriculate and a \$500.00 deposit within thirty (30) days of the date of this letter. If this program does not fit with your current career plans, please notify us as soon as possible both by phone (administrator phone #) and by faxing the attached statement declining admission to (administrator fax #).

Congratulations and we hope you will decide to join the students and faculty in this inaugural class of the MPHS program at Washington University School of Medicine. I look forward to hearing from you and please feel free to contact me or (administrator) with any questions related to the program and/or the offer for admission.

Sincerely,

Graham Colditz, MD, DrPH  
Program Director  
MPHS

## STATEMENT OF INTENT TO MATRICULATE

Student Name \_\_\_\_\_

This form must be completed by you and received by the Master of Population Health Sciences within thirty (30) days of the date of the offer of admissions letter.

Please check the one statement that applies:

### \_\_\_\_\_ **ACCEPTANCE STATEMENT**

I accept the offer of admission to Washington University School of Medicine's Master of Population Health Sciences Program in 2010/2011. This statement and the enclosed \$500.00 deposit will serve to reserve my position in this class.

\_\_\_\_\_  
Signature of Accepted Applicant Attesting to  
Acceptance of the Offer of Admission

\_\_\_\_\_  
Date

### \_\_\_\_\_ **DECLINATION STATEMENT**

I decline the offer of admission to Washington University School of Medicine's Master of Population Health Sciences Program in 2010/2011. This statement will serve to relinquish my position in this class.

\_\_\_\_\_  
Signature of Accepted Applicant Attesting to  
Declination of the Offer of Admission

\_\_\_\_\_  
Date

## **Washington University School of Medicine**

### **Masters of Population Health Sciences**

#### **Academic Affairs Proposal Summary**

**Updated April 7, 2010**

The administration for the Masters of Population Health Sciences (MPHS) program will be implemented in collaboration with the Clinical Research Training Center and managed in collaboration with their staff and through the home department of the Program Director, Graham A. Colditz, MD, DrPH, Niess-Gain Professor in the Department of Surgery. The program administrator will be housed in the CRTC.

The projections for this program include an ideal situation where the revenues generated are able to support the necessary costs, a situation we estimate to be around the break even point after 15 paying enrolled students plus 10 on training grants. The costs of the MPHS program are broken down into three components:

- 1) Administrative Salary/Fringes (to administer the program)
- 2) Faculty Salary/Fringes (to pay for the faculty time developing and teaching a range of new courses and adapting existing courses)
- 3) Other Expenses

The Faculty component is the largest portion of the projected budget (approximately 65% of the budget). These projections are shown below by assuming payments for faculty salary/fringes of \$18,000 for assistant professors and \$25,000 for senior level faculty. The Administrative component of the budget is projected to be around 25% of the total. The proposed costs may need to be adjusted if the growth in the number of students that enroll is slower than we anticipate (which will reduce the revenue to sufficiently fund the program). We could potentially reduce the effort levels of the Program Administrator, Program Director, and the Faculty member coordinating the medical student program for the joint degree and the second Faculty member coordinating the resident/fellow program. We are also assuming that, as directed by the Dean's office, present medical students may complete a 5<sup>th</sup> year of study for a joint degree with no additional tuition (tuition remission).

The following projections reflect the first five years of the program. In year 1 we expect 7 enrolled grant supported tuition students; year 2 we expect 10 enrolled paying students, 7 grant supported, and 5 medical students; year 3 with 25 enrolled paying students (10 on training grants and 15 paying cash) plus 5 medical students with tuition remission. Year 4 and 5 are projected as steady state of 10 students on training grants and 20 paying full tuition.

#### **Year 1 – Start-up**

- **Administrative Component: Approximately \$95K**
  - Program Director (10% FTE)
  - Deputy Director, medical students program (10% FTE)
  - Deputy Director, residents and fellows (10% FTE)
  - Program Administrator (100% FTE)
- **Faculty Component: Approximately \$222K**
  - Each 3-credit course requires faculty compensation.



- 5 required courses (2 new 3 modified) at 15% FTE each
- 5 new applied quantitative methods at 15% FTE each
- **Other Expenses: Approximately \$30K**
  - Consumables, copying and supplies
  - Computer access and maintenance
  - Advertising and web maintenance
- **Total Direct Costs for Start-up Year:  $\$95K + \$222K + \$30K = \$347K$  (with 7 enrolled training grant students at \$20K tuition each, the first year's deficit is projected to be around \$207K).**

## **Year 2 – Break-Even**

Here we assume we achieve 17 paying students, plus 5 medical students currently with tuition remission. The Deputy Directors increase to 20% each and Teaching Assistants are added for large classes.

- **Administrative Component: Approximately \$118K**
  - Program Director (10% FTE)
  - Deputy director, medical students program (20% FTE)
  - Deputy director, residents and fellows (20% FTE)
  - Program Administrator (100% FTE)
- **Faculty Component: Approximately \$309K**
  - Each 3-credit course requires faculty compensation.
  - 5 required courses at 15% FTE each
  - 9 new applied quantitative methods at 15% FTE each
- **Other Expenses: Approximately \$53K**
  - Consumables, copying and supplies
  - Computer access and maintenance
  - Advertising and web maintenance
  - Teaching assistants
- **Total Direct Cost for Year 2:  $\$118K + \$309K + 53K = \$480K$  (with 7 enrolled training grant students at \$20K tuition each and 10 enrolled students at \$34K, the second year would be at the break-even point with a loss of \$2K).**

## **Year 3 – Expanding the Program**

Here we assume we achieve 25 paying students, plus 5 medical students currently with tuition remission. Two additional courses will be added.

- **Administrative Component: Approximately \$121K**
  - Program Director (10% FTE)

- Deputy director, medical students program (20% FTE)
- Deputy director, residents and fellows (20% FTE)
- Program Administrator (100% FTE)
- **Faculty Component: Approximately \$355K**
  - Each 3-credit course requires faculty compensation.
  - 5 required courses at 15% FTE each
  - 9 new applied quantitative methods at 15% FTE each
  - 2 additional applied courses at 15% FTE each
- **Other Expenses: Approximately \$55K**
  - Consumables, copying and supplies
  - Computer access and maintenance
  - Advertising and web maintenance
  - Teaching assistants
- **Total Direct Cost for Year 3 = \$121K + \$355K + 55K = \$531K (with 10 enrolled training grant students at \$20K tuition each and 15 enrolled students at \$35K each, the third year would begin to generate a surplus of around \$190K).**

**Additional assumptions --** Flow of money to home program of instructors for students taking medical school based classes outside of the program is assumed to equal any flow inwards from students in other current Master's programs coming in.

### **Financing the Training Program**

Based on preliminary discussions and communications with training programs within Barnes-Jewish Hospital the clear demand from fellows for full-time training in research methods for population sciences, clinical and outcomes effectiveness research, we believe that this training program is of great value especially and will fill a currently unmet need in both population science training and rigorous epidemiologic methods. We have several fellows already willing to commit for FY11 (Fall of 2010) and training grants pending for AHRQ funding in health services research methods. Unmet expenses will be covered during the start-up period by the Dean's office, to be paid back as enrollment exceeds the break even number of 17 students, as projected for the expanded program.

In addition, the Institute for Public Health has received support from BJC for students training in graduate level programs, asking that preference be given to BJC employees. Details of this fund and its implementation are being defined and should also support some of the local applicants.

As with programs at Harvard, Hopkins, and the University of Penn, a number of medical trainees come from out of the system and are self supporting. While no advertising of the program has been implemented to date, limiting this source for year 1, we expect that this will generate up to two-thirds of the medical trainees from year 3 onwards. In any event, we expect the program to be fully successful and stand on its own by the end of the third year (FY13). The Department of Surgery is fully prepared to apply its resources for ensuring a degree program of the highest quality.

Budget projections are based on a 2.75 percent future increase in out years. With the priority to pay off deficit incurred in year 1, we expect to pay Deans overhead (5 percent) on cash tuition from year 4 onwards.

# Typical Student Course Calendar. (Required Courses are in bold text.)

Typical calendar: MD – Fellow or Resident

| Fall 1         |   |  |                               |  |  |
|----------------|---|--|-------------------------------|--|--|
|                | Monday  | Tuesday  | Wednesday                     | Thursday   | Friday   |
| 9-12 pm        | Biostatistics I   | Introduction to Epidemiology                                     | Biostatistics I               | Introduction to Epidemiology                                     |  |
| 1-4 pm         | Screening   |  | Screening                     |  |  |
| 4-5:30 pm      | Health economics & policy (B)   |  | Health economics & policy (B) |  |  |
| Fall 2         |   |  |                               |  |  |
|                | Monday  | Tuesday  | Wednesday                     | Thursday   | Friday   |
| 9-12 pm        | Biostatistics II  | Intermediate Epidemiology  | Biostatistics II              | Intermediate Epidemiology  |  |
| 1-4 pm         |   | Using Administrative Data for Comparative Effectiveness Research |                               | Using Administrative Data for Comparative Effectiveness Research | Decision Analysis for Clinical Investigation & Economic Evaluation |
| 4-5:30 pm      | Health economics & policy (B)   |  | Health economics & policy (B) |  |  |
| Winter Session |   |  |                               |  |  |
|                | Monday  | Tuesday  | Wednesday                     | Thursday   | Friday   |
|                | Short course: Introduction to Dissemination & Implementation Research Methods |  |                               |  |  |
| Spring 1       |   |  |                               |  |  |
|                | Monday  | Tuesday  | Wednesday                     | Thursday   | Friday   |
| 9-12 pm        |   | Randomized Controlled Trials                                     | Quality improvement           | Randomized Controlled Trials                                     | Applied Epidemiology   |
| 1-4 pm         |   | Ethical and Regulatory Issues in Clinical Research               |                               | Development and Validation of Prediction Rules                   | Mentored Biostatistics Research                                    |
| 4-5:30 pm      | Health care management (B)  |  | Health care management (B)    |  |  |
| Spring 2       |   |  |                               |  |  |
|                | Monday  | Tuesday  | Wednesday                     | Thursday   | Friday   |
| 9-12 pm        |   |  | Quality improvement           |  | Applied Epidemiology   |
| 1-4 pm         |   | Ethical and Regulatory Issues in Clinical Research               | Meta-analysis                 | Development and validation of prediction rules                   | Meta-analysis  |
| 4-5:30 pm      | Health care management (B)  |  | Health care management (B)    |  |  |

Typical calendar: MD/ MPHS joint degree (coursework to be taken after year 2, 3, or 4 of medical school)

| Fall 1           |   |  |                           |  |  |
|------------------|---|--|---------------------------|--|--|
|                  | Monday  | Tuesday  | Wednesday                 | Thursday   | Friday   |
| 9-12 am          | Biostatistics I   | Introduction to Epidemiology                                     | Biostatistics I           | Introduction to Epidemiology                                     | Current Topics in Public Health                                    |
| (10-12 pm)       | AIDS Epidemic   |  | AIDS Epidemic             |  |  |
| 1-4 pm           | Screening   |  | Screening                 |  |  |
| 4-5:30 pm (Olin) | Health Economics & Policy   |  | Health Economics & Policy |  |  |
|                  |   |  | Tobacco                   |  |  |
| Fall 2           |   |  |                           |  |  |
|                  | Monday  | Tuesday  | Wednesday                 | Thursday   | Friday   |
| 9-12 am          | Biostatistics II  | Intermediate Epidemiology  | Biostatistics II          | Intermediate Epidemiology  | Current Topics in Public Health                                    |
| (10-12 pm)       | AIDS Epidemic   |  | AIDS Epidemic             |  |  |
| 1-4 pm           |   | Using Administrative Data for Comparative Effectiveness Research |                           | Using Administrative Data for Comparative Effectiveness Research | Decision Analysis for Clinical Investigation & Economic Evaluation |
| 4-5:30 pm (Olin) | Health Economics & Policy   |  | Health Economics & Policy |  |  |
|                  |   |  | Tobacco                   |  |  |
| Winter Session   |   |  |                           |  |  |
|                  | Monday  | Tuesday  | Wednesday                 | Thursday   | Friday   |
|                  | Short course: Introduction to Dissemination & Implementation Research Methods |  |                           |  |  |
| Spring 1         |   |  |                           |  |  |
|                  | Monday  | Tuesday  | Wednesday                 | Thursday   | Friday   |
| 9-12 pm          | International Public Health   | Randomized Controlled Trials                                     |                           | Randomized Controlled Trials                                     | Applied Epidemiology   |
| 1-4 pm           |   | Ethical and Regulatory Issues in Clinical Research               |                           | Transnational Reproductive Health Issues                         |  |
| 4-5:30 pm (Olin) | Healthcare Management   |  | Healthcare Management     |  |  |
| Spring 2         |   |  |                           |  |  |
|                  | Monday  | Tuesday  | Wednesday                 | Thursday   | Friday   |
| 9-12 pm          | International Public Health   |  |                           |  | Applied Epidemiology   |
| 1-4 pm           |   | Ethical and Regulatory Issues in Clinical Research               | Meta-analysis             | Transnational Reproductive Health Issues                         | Meta-analysis  |
| 4-5:30 pm (Olin) | Health care management  |  | Health care Management    |  |  |

## **Clinical Epidemiology Programs offered at leading academic centers**

To place the needs and opportunities for clinical epidemiology training at Washington University School of Medicine in context we reviewed the activities of leading institutions in the US and internationally. In general, several of the leading programs offer summer courses tailored to clinical fellows (Johns Hopkins & Harvard Schools of Public Health, U Penn School of Medicine), as an adjunct to full year programs. In addition to a sequence of epidemiology and biostatistics courses applied courses in health service research, in meta-analysis and research synthesis, and often in use of large databases are common. Knowledge translation and implementation research methods focused on T2 issues are newer offerings at only a few programs. A recurring theme is that such programs have restricted enrolment to physician and others with clinical training.

Washington University School of Medicine has outstanding strength among faculty in epidemiology, knowledge translation, and implementing prevention strategies across the care continuum. Expertise in measures for health outcomes statistical genetics, and statistical methods applied to clinical trials and health service research is adequate to build additional applied courses.

The resident and fellow pool at Barnes is outstanding and many training programs have numerous trainees keen to obtain advanced training in research methods for clinical effectiveness and outcomes research. Staying in St. Louis allows clinical commitments tied before classes begin or after the term ends – options which the same trainees have trouble implementing if they go to Harvard, Hopkins or other training locations. The Olin Business School (Bruce Hall, MD MBA) and Brown School offer several courses in health policy. The Brown school has strong courses in behavioral aspects of health. The Medical Anthropology program includes international health and welcomes additional medical student.

Numerous programs use 4 8 or 9-week "terms" so that an adequate range of courses can be offered and the depth in methods needed for advanced courses can be covered in the first half of the program allowing far more advanced training in the second half of the year.

Typical programs are summarized briefly below.

## **1. Johns Hopkins School of Medicine and Bloomberg School of Public Health**

- Welch Center for Prevention, Epidemiology, and Clinical Research integrates General Internal Medicine (medical School) and Epidemiology faculty (School of Public Health). This organization is hampered by primary appointments in two separate schools and non-communicating technology and career expectations often for faculty in adjacent offices.
- Clinical Epidemiology Training Program
- Clinical Research includes
  1. Patient-oriented research
  2. Epidemiology and Behavioral Sciences
  3. Outcomes Research and Health Services Research
- Clinical Epidemiology Training Program offers masters (Master of Health Sciences and Masters of Science) and doctoral degrees
- In addition to core courses students takes courses in clinical trails, CVD epidemiology, genetic epidemiology, and advanced biostatistics

## **2. University of Pennsylvania School of Medicine**

- Offers Masters of Science in Clinical Epidemiology (MSCE)
- Directed by faculty from CCEB (Center for Clinical Epidemiology and Biostatistics)
- Applicants are MD's or must have advanced degree
- Core Courses
  1. Introductory Epidemiology (EP 510)
  2. Introductory Biostatistics (EP 520)
  3. Statistical Methods for Epidemiologic Research (EP 521)
  4. Database Management for Clinical Epidemiology (EP 532)
  5. Measurement of Health in Epidemiology (EP 542)
  6. Issues in Research Protocol Development (EP 560)
  7. Critical Appraisal of the Medical Literature (EP 570)
  8. Tutorial in Epidemiologic Research (EP 610)
- Tracks
  1. Epidemiology,
  2. Health Services Research,
  3. Human Genetics,
  4. Bioethics,
  5. Clinical Trials

### 3. Harvard School of Public Health and Brigham and Women's Hospital

#### Clinical epidemiology and clinical effectiveness

The Program in Clinical Effectiveness is designed for the clinician seeking the quantitative and analytic skills needed for clinical research or interested in health care administration. Of over 1,000 trainees followed up in 2006 approximately 44% pursues clinical trials, 54% epidemiology, and 41% pursued health services research.(Goldhamer et al 2009)

This program begins with an intensive seven-week, 15-credit summer program, which contains summer-long core courses in *Clinical Epidemiology and Biostatistics*. All participants also select two half-summer courses from offerings in *Current Issues in Health Policy*, *Decision Analysis in Clinical Research*, *Ethical Basis of the Practice of Public Health: Health Care Delivery*, *Improving Quality in Health Care*, *Linear and Longitudinal Regression*, *Medical Informatics*, *Methods for Decision Making in Medicine*, *Research with Large Databases*, and *Survey of Methods and Applications in Health Services Research*. For students with previous experience, second level courses are also offered in *Analytic Issues of Clinical Epidemiology*, *Principles of Clinical Trials*, and *Survival Methods in Clinical Research*.

Two major options build from this – and MPH with a concentration in clinical effectiveness and a Master of Science degree in epidemiology.

#### MS Epidemiology

Program that can build on the summer clinical effectiveness. Major focus on epidemiology and biostatistics for clinical research.

|           |   |
|-----------|---|
| EPI 201   | Introduction to Epidemiology                        |
| EPI 202   | Elements of Epidemiologic Research                  |
| EPI 203   | Study Design in Epidemiologic Research (07-08 only) |
| EPI 204   | Analysis of Case-Control and Cohort Studies         |
| BIO 201   | Introduction to Statistical Methods                 |
| BIO 210   | Analysis of Rates & Proportions                     |
| OR BIO213 | Applied Regression for Clinical Research            |

#### *Recommended*

|         |   |
|---------|---|
| EPI 203 | Study Design in Epidemiologic Research (08-09 only)                           |
| EPI 215 | <i>Adv Topics in Analysis of Case Control and Cohort Studies (08-09 only)</i> |

### 4. University of Washington School of Public Health

Has Clinical Research Track within MS in the Epidemiology Program (Other tracks: General Epidemiology, Genetic Epidemiology). Biostatistics and Health Services Departments also have similar masters tracks.

Degree programs designed For MDs.

- Requires **EPI 542 Clinical Epidemiology (2) Weiss**  
Principles and methods involved in studying the outcome of illness
- Requires **EPI 573 Methods and Issues in Using Biological Measurements in Epidemiologic Research (3) Schwartz**



Introduction to use of measurements from biological specimens in epidemiologic studies. Prepares epidemiology and laboratory science students for conduct of interdisciplinary human studies. Evaluation of biomarkers, preliminary studies, methodologic issues, quality control.

- The required courses for the MS Clinical Research Track are:

|                |   |             |
|----------------|---|-------------|
| BIOST 517, 518 | Applied Biostatistics I, II (BIOST 511-513 does not meet this requirement)  | 8 Credits   |
| EPI 573        | Methods and Issues in Using Biological Measurements in Epidemiologic Research (Counts as EPI elective, but not Disease/Exposure elective) | 3 Credits   |
| EPI 542        | Clinical Epidemiology (Counts as SPH elective)  | 2 Credits   |
| BIOST 524      | Design of Medical Studies (Counts as SPH elective)  | 3 Credits   |
| EPI Elective   | One Disease/Exposure elective of at least 2 credits. See <u>MS Clinical Research Checklist</u> for a list of acceptable electives         | 2-4 Credits |

- And one of the following:

|            |  |            |
|------------|--|------------|
| Non-credit | Biomedical Research Integrity (BRI) Lecture Series (Proof of attendance required for 3 lectures and 3 discussion sections) offered each late spring and summer. Register early May to guarantee a place. Registration Information: <a href="http://depts.washington.edu/uwbri">http://depts.washington.edu/uwbri</a> | Non-credit |
| BH 536     | Research Ethics and Regulation   | 3 Credits  |

## 5. University of California at San Francisco

### Department of Epidemiology and Biostatistics - Division of Clinical Epidemiology

- **Summer Clinical Research Workshop** The Summer Clinical Research Workshop includes three courses that are the starting point for all clinical research training at UCSF. They provide an introduction to the world of clinical research that is structured around individualized written products that trainees will find useful--a 5-page protocol for an actual study, a resolution of ethical issues in that study, and a career plan. For individuals who will participate in clinical research in a supportive capacity, the Workshop alone is sufficient training. For others desiring to be independent investigators, the Workshop serves as introductory material for the more advanced ATCR Certificate and Master's Degree in Clinical Research Program.
- **Masters Degree Program in Clinical Research** - two-year course of study intended for advanced pre-doctoral students, post-doctoral fellows, and faculty members who wish to master clinical research methods and pursue independent research careers. Course work includes instruction in advanced epidemiologic and biostatistical methods and specialized topics such as outcomes research, medical informatics, molecular

methods in clinical research, and decision and cost-effectiveness analysis. Requirements include a comprehensive review of the literature in the scholar's field, presentation of original work at a national scientific meeting, and publication of a peer-reviewed manuscript. Scholars will work closely with mentors in their home departments and preceptors chosen from the TICR faculty.

- **Advanced Training in Clinical Research Certificate Program** - ATCR is a four academic quarter program intended for advanced pre-doctoral students, post-doctoral fellows and faculty members who desire rigorous training in the methods and conduct of clinical research. This includes instruction in the epidemiologic and biostatistical methods used in observational and experimental clinical research as well as training in the oral and written presentation of clinical research. In addition to required coursework, scholars are expected to develop and implement their research projects throughout the year and will have access to TICR faculty for methodologic guidance. Trainees achieving program objectives are granted a Certificate of Program Completion

## 6. UNC Gillings School of Global Public Health, Chapel Hill, North Carolina

- Offers a Masters of Science in Clinical Research, which is interdisciplinary but is housed within the Department of Epidemiology
- Sponsored by TraCS (North Carolina Translational and Clinical Sciences)
- Candidates must have MD or other doctoral degree and have a mentor
- Three tracks
  1. Translational
  2. Clinical Trials
  3. Health Services/Population Studies (includes health services research (HSR), observational studies, decision analysis, health behavior, pharmaco-epidemiology)
- Courses
  1. Clinical measurement and evaluation (introductory clinical epidemiology)
  2. Project development
  3. Epidemiology of Medical Care (quality of care, variations in care, ...)
  4. Biomarkers
  5. Pharmaco-epidemiology
  6. Health Services Research methods
  7. Large Data Bases

## 7. University of Toronto

- Offers PhD and MSc in clinical epidemiology.
- PhD curriculum exposes students to the full breadth of the discipline, including trials methodology, quality of life measurement, meta-analysis, guidelines development, decision analysis, health services research, non-experimental design, and clinical economics.

## 8. McMaster University – Department of Clinical Epidemiology and Biostatistics

This is among the longest standing programs focused on the application of epidemiologic methods to clinical outcomes research

- **Health Research Methodology (HRM) Program** in the Faculty of Health Sciences provides training at the MSc and PhD level
- Skill domains for MSc: research synthesis, research design, data gathering, knowledge translation, data analysis. Communication, measurement tools
- PhD domains:
  - Effectiveness of clinical therapies ,
  - Screening for and diagnosing disease and risk factors for disease ,
  - Preventing, treating, ameliorating, or rehabilitating health problems,
  - Predicting the course of disease ,
  - Determining the cause of health problems ,
  - Measuring "burden of illness," "quality of life," and the effects of health services innovations ,
  - Systematically summarizing evidence from research , Increasing the quality of health care and improve outcomes

## 9. Erasmus University, The Netherlands

### Research Masters Program in Clinical Epidemiology

Students specialize in one area:

- Epidemiology
  - Clinical Epidemiology
  - Genetic Epidemiology
  - HSR
  - Public health
  - Medical Informatics
- Begins with Erasmus Summer program
  - Courses
    - Introduction to Decision Making in Medicine (ESP49)
    - Clinical Decision Analysis (ESP04)
    - Methods of Clinical Research (ESP10)
    - Clinical Epidemiology (CE02) - Rotterdam
    - Intervention Research and Clinical Trials (EWP04)
    - Diagnostic Research (EWP05)
    - Prognosis Research (EWP16)
    - Advanced Topics in Clinical Trials (EWP10)
    - Advanced Analysis of Prognosis Studies (EWP13)
    - Advanced Topics in Decision-making in Medicine (EWP02)
    - Clinical Trials and Drug Risk Assessment (CE04)
    - Advanced Diagnostic Research (CE10)

## MPHS FAQs

### **What is the difference between the MPHS and the MSCI/GEMS/MPE/MPH?**

Washington University in St. Louis offers several master degree programs within the field of public health. Each is distinct in its target audience (e.g. clinicians, pre-doctoral students, postdoctoral trainees), focus (e.g. quantitative methods, clinical research, applied public health, genetic epidemiology, statistical genomics), and approach (e.g. coursework vs. mentored research vs. practicum). More specifically:

The Master of Population Health Science (MPHS), offered by the School of Medicine, is designed as a one-year full-time degree program that meets the needs of clinicians seeking training in clinical research methods. Its quantitative curriculum emphasizes the role of epidemiology and biostatistics in approaching clinical effectiveness and outcomes research. Although there is no research component to the degree, an emphasis on applied coursework allows for students to focus application of concepts in areas most relevant to their clinical careers including development of research study protocols, performing systematic reviews, and designing epidemiologic studies.

The [Master of Public Health](#) (MPH), offered by the George Warren Brown School of Social Work, is a two-year full-time program that aims to train non-physicians who are committed to improving the health of communities for a future in public health. It's innovative curriculum uses transdisciplinary problem-solving to present and apply principles to improve population health, with a focus on vulnerable communities and populations. The application of evidence based approaches to public health is a feature of this training. The degree includes an applied practicum component in the final year of study. Core courses include: epidemiology; biostatistics; behavioral health; environmental health; health management and policy; as well as research methods and program planning, implementation and evaluation. In addition, students complete 3 courses focused on transdisciplinary problem solving and 2 electives.

The [Master of Science in Clinical Investigation](#) (MSCI), offered by the School of Medicine, is a research focused degree in clinical investigation. It requires completion of an independent research project, core coursework in biostatistics, clinical research design, epidemiology, legal/ethical issues in clinical research, and grant and manuscript writing, and electives relevant to the student's research interests. The degree is offered to participants in pre-doctoral and post-doctoral mentored research training programs at WUSM, including scholars in programs offered through the [Clinical Research Training Center](#) and participants in institutional K12 programs. Pre-doctoral trainees typically earn the degree in one additional year of training. Post-doctoral trainees typically participate part-time and complete the degree over 2-3 years.

The [Genetic Epidemiology Master of Science Training Program](#) (GEMS), offered by the School of Medicine, is a 12-14-month full-time degree program that provides training to those who seek to understand the interaction between genetic and environmental factors and health on a population level. The program offers two options: A 12-month clinical track offers flexible training for physician scientists and other clinicians; a 14-month track offers training in genetic epidemiology methods and software for the non-clinician.

The [Master of Psychiatric Epidemiology](#) (MPE), offered by the School of Medicine, is a 13-month full-time degree program that prepares post-doctoral fellows and pre-doctoral students for an active research career in psychiatric epidemiology, with an emphasis on behavioral risk factors. Students develop practical research skills and learn basic epidemiological and survey research methods that can be applied to many disciplines. Degree students come from varied

backgrounds such as public health, social work, engineering, nursing, math, psychology and anthropology.

**How many credits can I take each semester?**

A minimum of 12 credit hours is required for a full-time student status, and the maximum courseload is 18 credit hours per semester. Overload requests must be approved by the Program Director.

**Can courses be taken pass/fail?**

At least 18 of the required 35 credit hours must be taken for a grade. Required courses cannot be taken pass/fail.

**What is the minimum GPA required for graduation?**

Students must maintain an overall grade point average of 3.0 on a 4.0 scale. A minimum grade of "B" is required in the required courses, with a minimum of "C" (equivalent to "Pass") in electives.

**Can I transfer credit?**

Transfer credit from courses taken outside of Washington University will not be accepted. A maximum of 9 transfer credits will be accepted for courses taken through other Washington University schools and programs. Medical school coursework will not be accepted for transfer credit.

**Do withdrawals show up on my transcript?**

Students who withdraw from a course within the first week of an 8-week course or by the "last day for drops" as established by the University for a full-semester course will not have any notation on their transcript. Anyone who withdraws after those dates will receive a "W" on the transcript.

**Can I be a part-time student?**

The program is designed for full-time study. Students wishing part-time study are encouraged to consider non-matriculated status prior to full-time enrollment.

**Can I take courses as a non-matriculated student?**

A maximum of three classes may be taken on a non-matriculated basis. Any courses taken as non-matriculated status may be applied to the degree within three years of taking the classes.

**Does the program offer summer classes or workshops?**

As the program grows, it is anticipated that additional summer short courses and/or workshops will be added to the curriculum.

**Can I apply if I don't have a clinical degree?**

The program is designed for students who have clinical training or expertise in healthcare or a health-related field. The pace of coursework assumes students have familiarity with clinical medicine.

**Can I complete a concentration within the degree?**

At this time, there are no formal concentrations within the MPHS. However, students may focus their elective coursework within an area of particular interest (e.g., outcomes effectiveness, international health).

**Are online courses offered?**

Currently, no courses are offered online.